# Heart Tracker 3

## *Professional Edition*

**Comprehensive Stress Management System**

***User's Manual***

**Version 3.0**

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# Technical Support

Call: Contact your local dealer

Write: support@biocomtech.com

Visit: www.biocomtech.com

Call your local dealer for:

- Product installation
- Troubleshooting
- Product use

According to our customer support policy we charge customers $60.00 an hour with $15.00 increments for all incoming calls and $75.00 an hour when we return calls.

Each new customer has one hour of technical support free. If a computer and peripherals comply with our requirements and configured properly, there is enough time to get the system up and running within this hour.

Any support related to hardware repair, accessories and supplies replacement is free of charge.

We encourage you to send us any reports on possible software bugs, comments and suggestions about this product.

Biocom Support Team

# 1. Basic Concept

The human organism is under the continuous control of the autonomic nervous system (ANS). The ANS is evolutionarily the oldest part of the human nervous system that cannot be voluntarily controlled by our thoughts. The main purpose of the ANS is to control all organs and systems to maintain optimum performance of the organism influenced by various internal and external factors. This control is carried out by the two branches of the ANS called the sympathetic nervous system (SNS) and the parasympathetic nervous systems (PNS).

Generally SNS causes the so-called "fight or flight" response needed to mobilize all of our organisms' resources to withstand any stress factors (stressors) - certain changes in outer or inner environment that cause discomfort or even harm to our organisms. Once the immediate threat of stressor is alleviated, PNS takes control of the organism, bringing it back to normal optimum function. Strong functioning of both the SNS and PNS allows our organisms to function effectively over time.

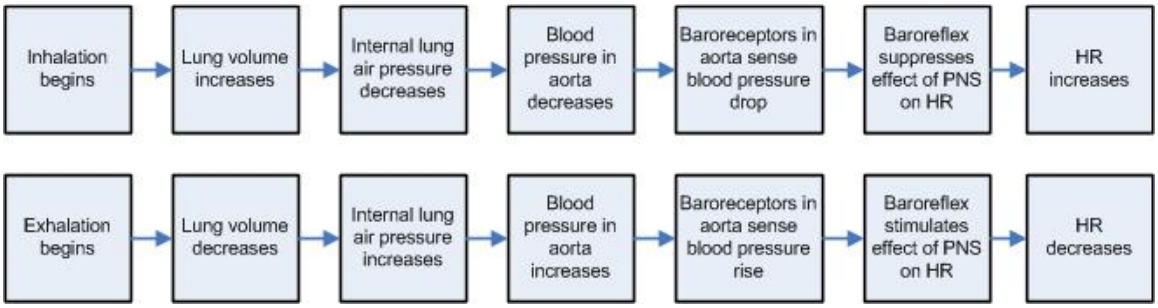
Chronic long-term stress often causes malfunctioning of ANS regulatory functions, which can become a precursor of various detrimental health conditions. Under chronic stress, the PNS primarily suffers. This results in an inability to adequately regulate body function. This fact shows a strong reason to give people a tool to positively affect on PNS to bring it back to normal functioning.

Everybody knows that human muscles become stronger and function more effectively if regular physical exercises are given to them. Same can be done to the PNS. Fortunately there is a key element of PNS that can be positively affected in a special training regimen serving as a sort of exercise to the PNS. This is the mechanism of baroreflex. Its basic function is to regulate heart rate (HR) depending on actual level of blood pressure (BP) in central blood vessels, primarily in aorta. Its main goal is to provide an adequate blood supply to all vital organs, such as brain, heart, lungs, etc. There are special sensory cells in the aorta wall called baroreceptors that sense the level of BP and send the signals to the brain structures via special nerves. Those baroreceptors, nerve fibers and specific brain structures are all part of the PNS. Their job is to check the BP level and send signal back to heart to set certain level of HR. It works in such a way that if BP in aorta drops, HR rises and vice versa. This mechanism adjusts the HR to maintain balance and keep the blood supply sufficient.

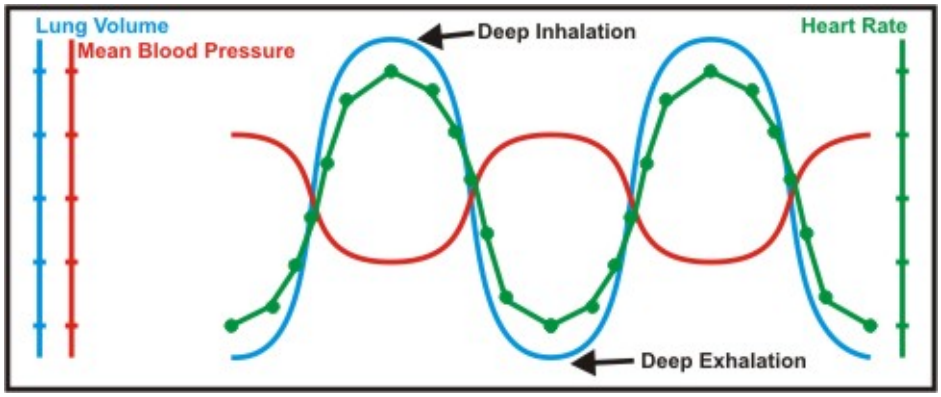
Thus to train PNS system we need to have a positive impact on the baroreflex mechanism to cause increased stimulation of PNS. It appears that deep breathing is an easy mind controlled way to do such stimulation providing an effective exercise regimen to the PNS. It was found that baroreflex mechanism is exceptionally responsive to periodic stimulation at certain rate, particularly at 0.1 Hz (also called the resonant frequency), which can be provided when breathing deeply and evenly at 6 breaths per minute. This regimen is especially effective when

such breathing is controlled by a specially established visual and/or auditory pacer (or metronome).

Below is a diagram describing how baroreflex mechanism works.




Below is the diagram showing relationship between breathing, BP and HR as per details above.




This diagram shows that when breathing occurs at resonant frequency, HR should have the most profound oscillations synchronous with breathing. By the end of deep inhalation HR reaches its maximum level and respectively by the end of exhalation HR reaches its minimum level.

This physiological phenomenon, also known as respiratory sinus arrhythmia (RSA), sets the ground for a training technique as a key element of the Heart Tracker system.

The training tool has means to provide both visual and auditory breath pacer as well as the way to read actual HR. Breathing according to breath pacer and observing actual HR establishes a biofeedback loop, which is essential to have a successful training outcome.

**Important!** It is important to understand that none of the physiological data measured by the Heart Tracker is to be used for diagnostic purpose. The information being recorded will vary greatly between individuals. Age, heart irregularities, chronic conditions all could affect the reading by this instrument.

**Important!** Individuals should use this instrument for achieving better function of the internal regulatory mechanisms. It is important to understand that no dramatic improvement could happen overnight. Regular use of this tool (10-20 minutes per day) should gradually bring your regulatory systems to better function enhancing your overall health condition.

# 2. Getting Started

## 2.1. Sensor Placement

## 2.1.1. Proper Pulse Wave Sensor Placement And Use

You can record heart rate data using Biocom HRM-02 pulse wave sensor with an ear-clip probe.

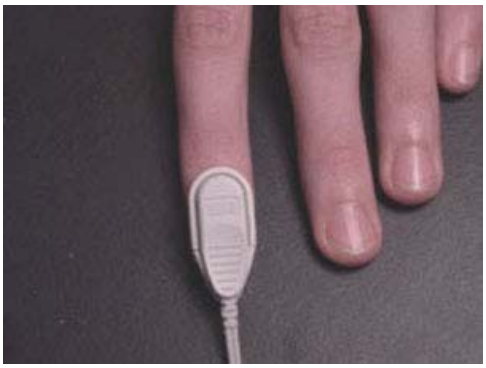
The device has a small plastic box with a long USB cable and round stereo-type jack connector.

A separate ear-clip sensor probe is connected to the device box.

Connect the device USB cable to any USB port in the computer. The software will detect it automatically.

Place an ear-clip on the left or right ear lobe. Make sure it is placed so that small glass windows on the inside surfaces of the clip are in good contact with soft tissue of the ear lobe. Be aware that proper placement will affect the quality of pulse wave signal. Small ear lobes or earrings may make placement more difficult.

In some cases when earlobe placement does not give good pulse wave signal the ear-clip can be placed on a finger.



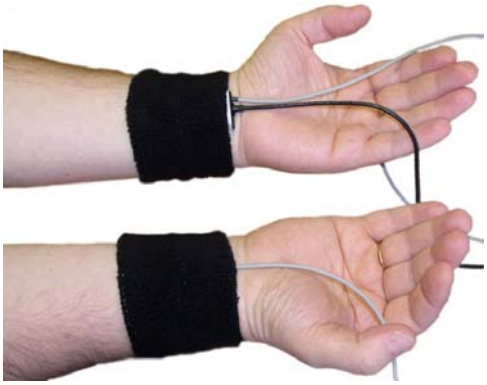
# 2.1.2. Proper ECG Sensor Placement And Use

You can record heart rate data using Biocom 4000 ECG Recorder device.

The device has a small plastic box with a long USB cable. Two large round electrodes are attached to the bottom side of the box. Another lead wire comes out of the box and ends up with a third large round electrode pad.

Connect the device USB cable to any USB port in the computer. The software will detect it automatically.

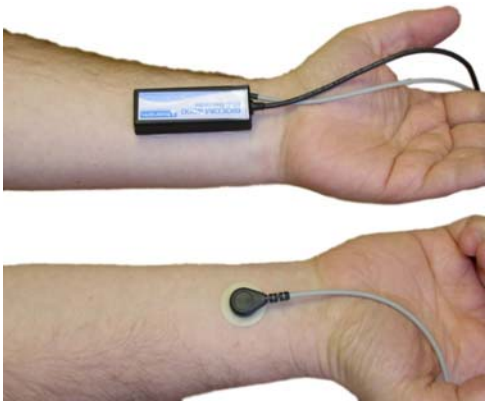
It is recommended to wipe the surfaces of all three round electrodes with rubbing alcohol before electrode placement.



Put two elastic wristbands on both wrists.

Place the device box on the left wrist underneath the wristband so that two round electrodes on the bottom side of the box make contact with skin.

Put the box along the arm so that both USB and lead wire cables are oriented towards the palm.



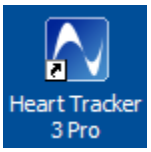
Place the plastic electrode pad of the lead wire on the right wrist underneath the wristband so that large round electrode makes contact with skin.

Put the electrode pad on the arm so that lead wire cable is oriented towards the palm.

## 2.2. Start the Heart Tracker 3 Pro Software

You can start the Heart Tracker 3 Pro software in two possible ways:

Option 1:

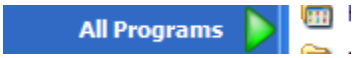



Double-click this shortcut icon on the Windows desktop screen to start the Heart Tracker 3 Pro.

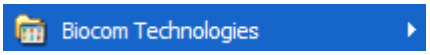
Option 2:

Use system menu as follows:

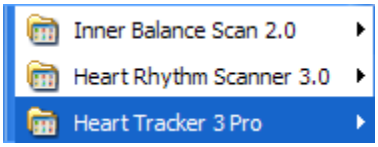
Click the **Start** button on Windows task bar.



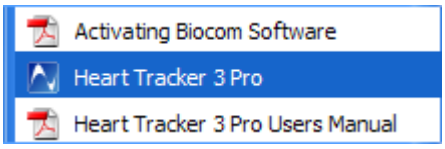

Select **All Programs** menu option.




Select the **Biocom Technologies** folder from the menu list.



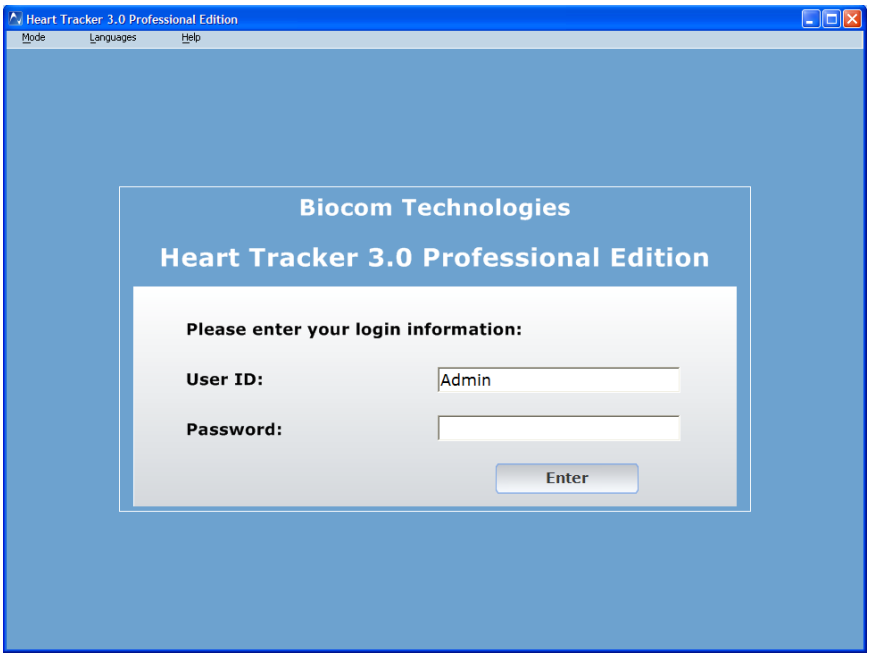

Select **Heart Tracker 3 Pro** folder from the menu list.




Select **Heart Tracker 3 Pro** option from the open folder menu.

# 3. Login Options

Once the program started, the following application window comes up:




You must login to the system as a user of certain type: administrator or regular user. Administrators have extra privileges to manage various aspects of the system performance and user's data.

Enter an appropriate **User ID** and password then click on this button to continue.

Note: Upon first login the default User ID is "Admin" and password is blank. You can later modify them once inside the program.

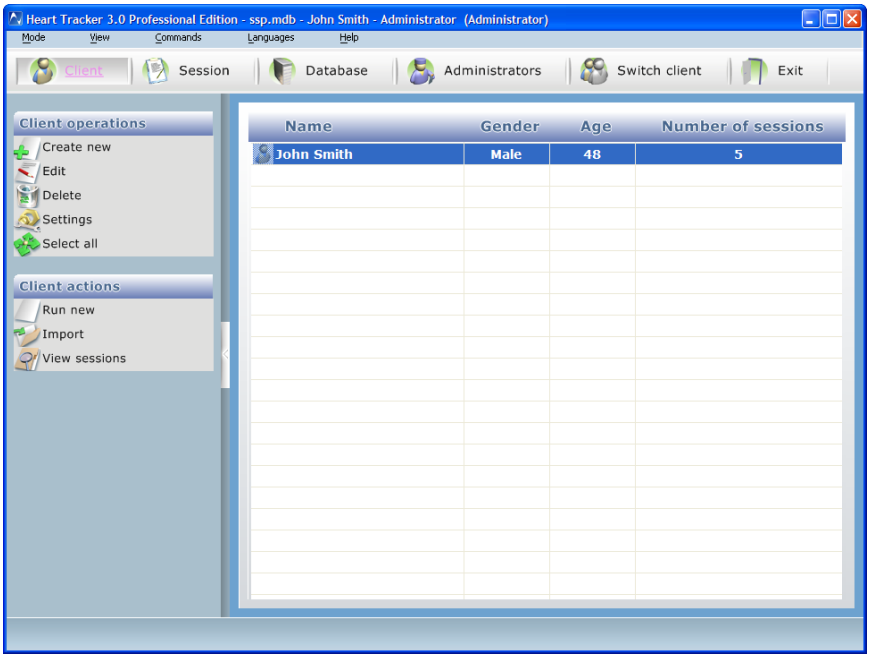
Upon logging in, you come to the main menu. The menu you come to depends on whether you are logged in as an administrator or as a regular (or temporary) user.

## 3.1. Administrator Login

The administrator is a special type of the system user. The administrator is responsible for maintaining the system database. More than one system administrator is allowed.

When you log in as an administrator the system will check the list of administrators to find an administrator record matching entered User ID and password.

Once you login as an administrative user the following window will open:



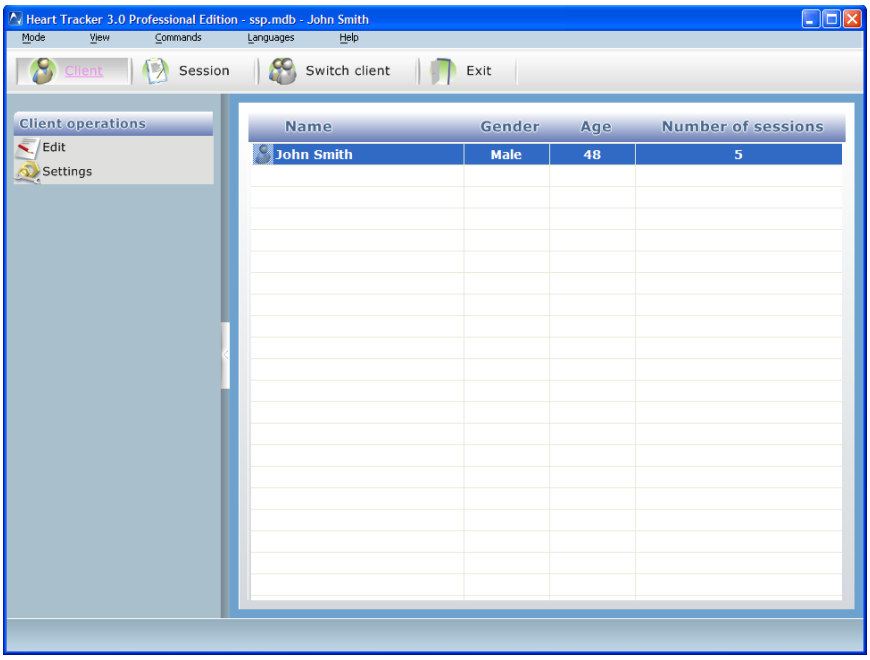

Use top menu or User's Operations menu options to perform desired functions.

## 3.2. Regular User Login

The regular user is able to access all of the basic functions of the Heart Tracker 3 Pro.

Typically regular users utilize passwords to log into the system.

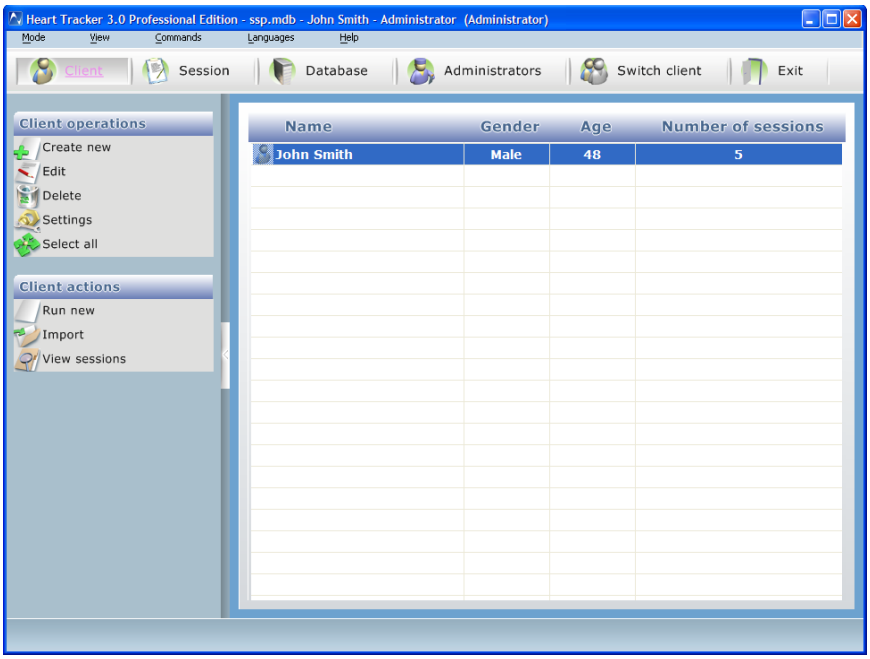
Once you login as a regular user the following window will open:



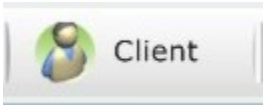

Use top menu or User's Operations menu options to perform desired functions.

# 4. Administrator Functionality

Once you login as an administrator the following window shows up:




The top menu contains the following menu options:




Manage clients (default).

Manage session records.

Manage databases.

Manage administrators.

Switch to another user by logging off current one and logging on another.

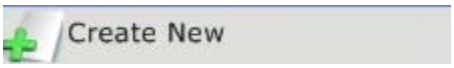
Exit the software.

Click the selected menu item to perform specific program task.

# 4.1. Client Operations

Click on the **Client** button of the top menu to switch to client operations mode. This will bring the list of clients shown above.

The administrator's Client Operations Menu is on the left side of the screen. Here, you have the following options:




Create a new client profile.

View / edit an existing client profile.

Delete an existing client profile.

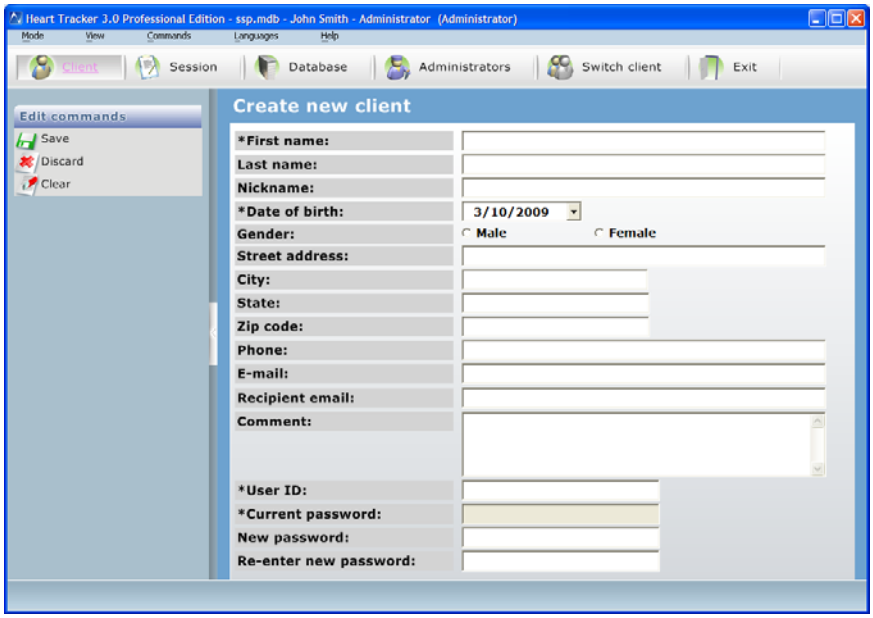
View / edit program settings associated with selected client.

Select all existing client profiles.

## 4.1.1. Creating New Client

This option is helpful when administrator manages a group of clients.

Once you select the **Create New** menu option the following form opens:




Enter your data into each field. The required fields are marked with an asterisk.

Upon completion of this form, you have several options:

Select this menu option to save the current information.

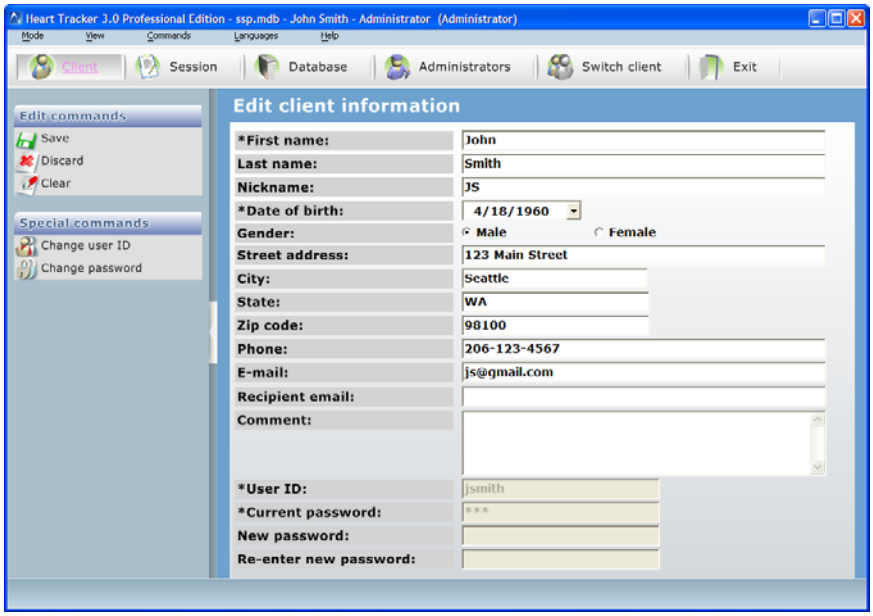
Select this menu option to cancel this operation and return to the system login.

Select this menu option to clear the form and start again.

It is recommended to enter a new password in the client record being created to increase level of data privacy. Type in a new password and re-type it to confirm it in the **New Password** and **Re-enter New Password** fields.

## 4.1.2. Editing Client Profile

Once you select the **Edit** menu option in the Client Operations Menu the client information form will opens:




You can modify the client information as described in the previous section.

You may also change the User ID by clicking the respective menu options.

Select this menu option to change your user ID.

Once a respective data filed becomes enabled, type in a new user ID.

Select this menu option to change your password.

Type in the current password into the **Current Password** field. If you have no password, leave the field blank.

Type in a new password and re-type it to confirm it in the **New Password** and **Re-enter New Password**. You may leave them blank to remove the password.

## 4.1.3. Deleting an Existing Client

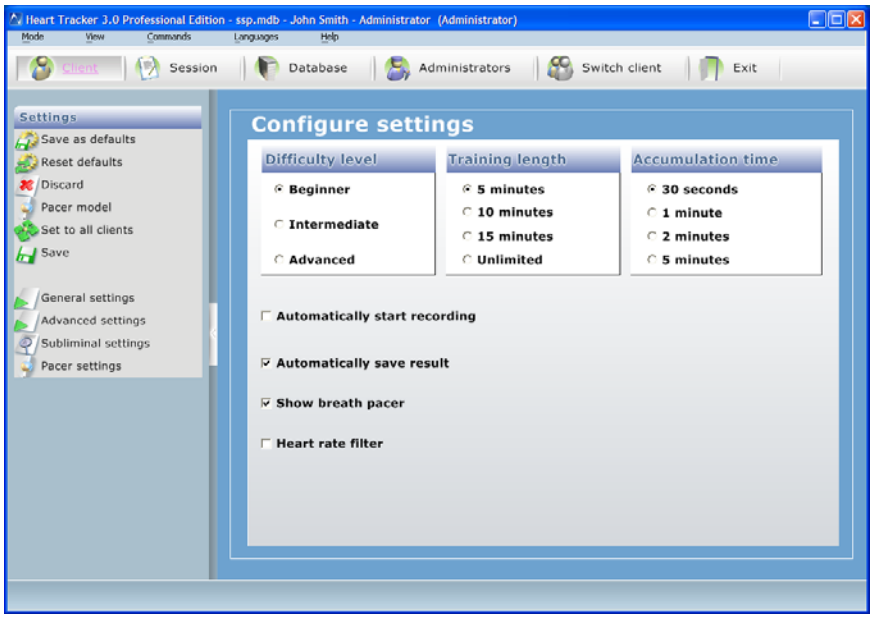
To delete an existing client profile, highlight the profile in the list that you wish to delete then click on the **Delete** menu option in the Client Operations Menu.

A dialog box will open and warn you that the selected client's records and session data are about to be deleted. If you wish to proceed choose **Yes**.

**Important!** Deleting client's record will permanently destroy all data previously recorded in the client's record.

## 4.1.4. Editing Client Settings

You may edit your client settings and preferences by clicking on the **Settings** menu option in the Client Operations Menu. The following window appears:




The form contains four settings groups:

| | |
|---|---|
| Pacer model | Breath pacer model settings. |
| General settings | Various settings of general kind. |
| Advanced Settings | Various biofeedback training settings. |
| Subliminal Settings | Special settings related to subliminal priming method used in training. |
| Pacer settings | Various advanced pacer settings. |

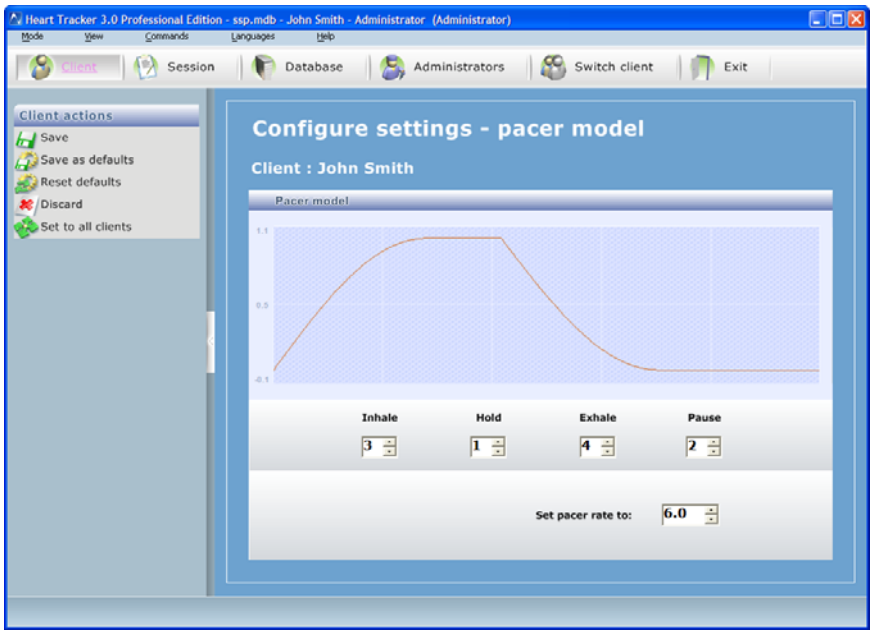
Select an appropriate menu option to switch to a respective group of settings.

Once you are satisfied with your settings, you may:

| | |
|---|---|
| Save as defaults | Select this menu option to save your settings as the default settings for all profiles. |
| Reset defaults | Select this menu option to revert back to your default settings. |
| Save | Select this menu option to save your settings. |
| Discard | Select this menu option to cancel settings modifications without saving. |
| Set to all clients | Select this menu option to set new settings to all your clients. |

## 4.1.4.4. Pacer Model Settings

You may set the breath pacer model settings for selected client by clicking on the **Pacer Model** menu option. The following window opens:

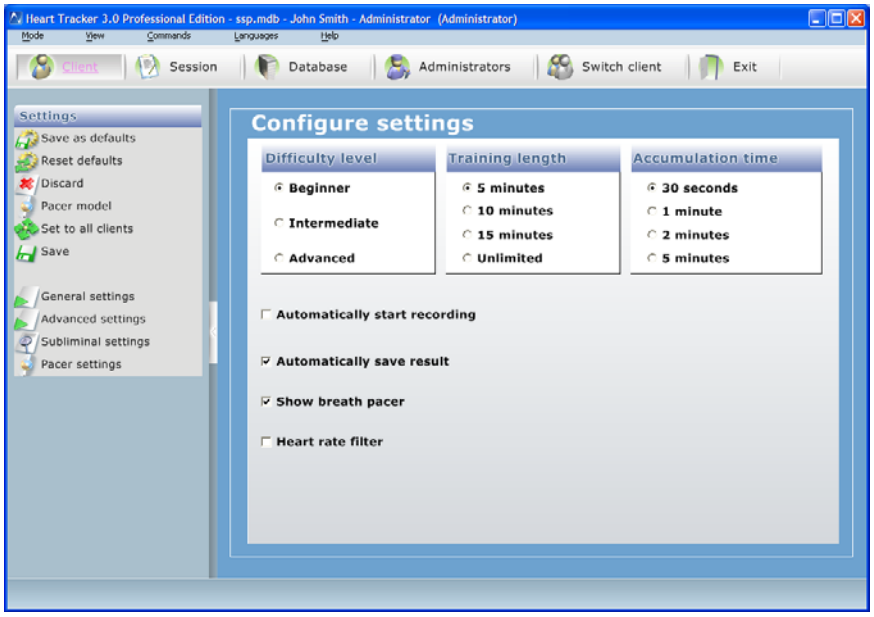



Use appropriate spin-boxes to set durations of the breath pacer cycle phases in seconds: **Inhale**, **Hold**, **Exhale** and **Pause**.

These setting determine the default pacer rate. However you can set an initial pacer rate to be used in training to different value. In this case a default pacer model will be adjusted to this specific rate.

## 4.1.4.2. General Settings

When **General Settings** menu option is selected the following window opens:




Here, you may set the following parameters:

**Difficulty level** — To change the scoring criteria to make achieving a good score easier or harder, set this parameter to one of the following options:

**Beginner**, **Intermediate**, or **Advanced**

**Training length** — To change the length of your actual training sessions, set this parameter to one of the following options:

**5 Minutes**, **10 Minutes**, **15 Minutes**, or **Unlimited**

**Accumulation time** — To change the amount of time for the program to accumulate data before your training score will show up, set this parameter to one of the following options:

**30 Seconds**, **1 Minute**, **2 Minutes**, or **5 Minutes**

**Automatically Start Recording** — Choose whether or not you wish to automatically start recording your session data.

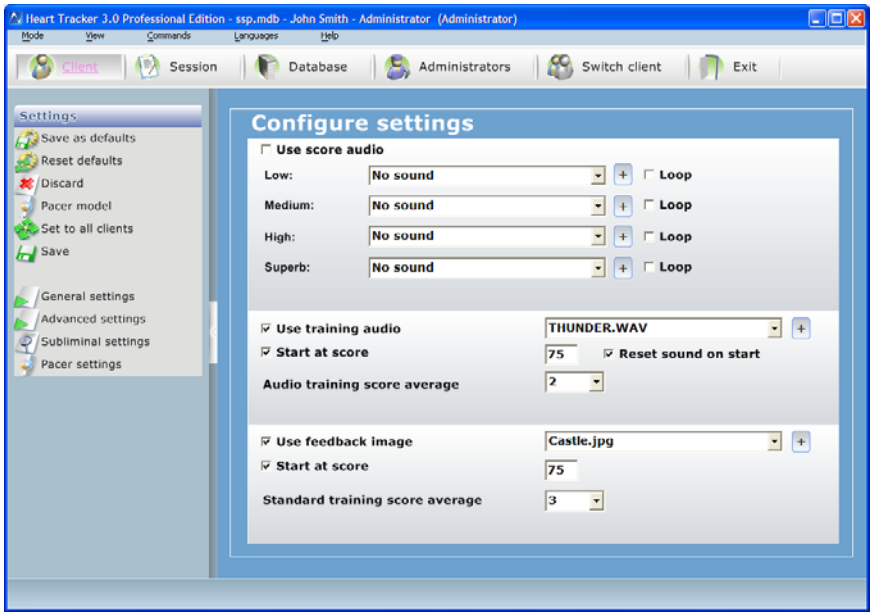
**Automatically Save Result** — Choose whether or not you wish to automatically save your recorded data.

**Show Breath Pacer** Choose whether or not you wish to have the breath pacer to assist you in your breathing.

**Heart Rate Filter** Choose whether or not you wish to filter sharp spikes on the heart rate graph.

## 4.1.4.3. Advanced Settings

When **Advanced Settings** menu option is selected the following window opens:




You may set the program playing specific audio files to indicate in which score band your current score is. To do this:

1. Set the **Use score audio** checkbox.
2. Choose a sound from one of the drop-down lists for each category (or a custom one by clicking on the **+** button).
3. You may choose to loop the sound by (un)checking the **Loop** option.

You may set the program to play a specific training audio file. To do this:

1. Check the **Use Training Audio** checkbox.
2. Select the sound from the drop-down list (or a custom one by clicking on the **+** button).

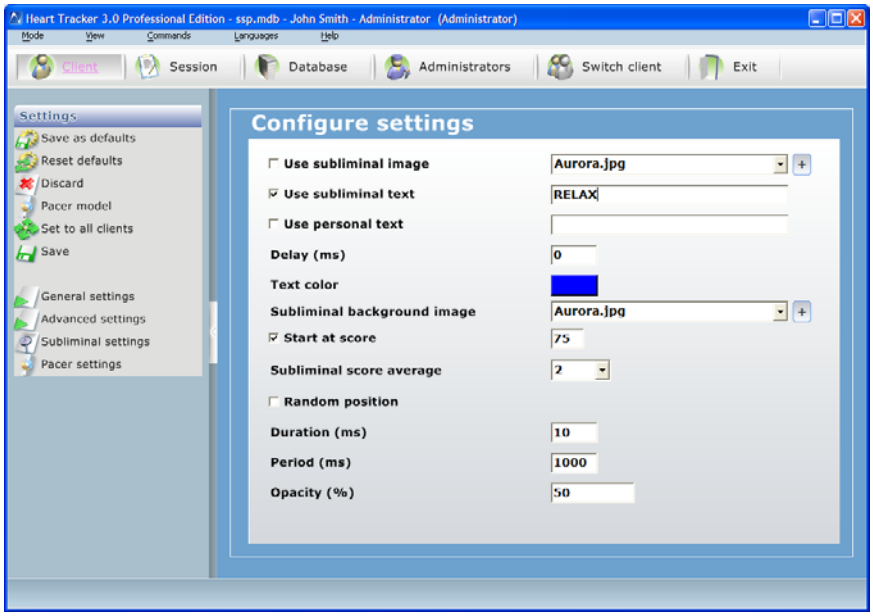
3. You may choose to play the sound only once the score reaches certain level by checking the **Start at SCORE** option and entering the score threshold level.
4. You may choose to restart playing selected sound every time the sound is turned on by setting the **Reset sound on start** checkbox. If it is not set, the sound will continue playing from the position where it stopped when the score dropped below the threshold.
5. You may apply an averaging filter to the training score that drives playing audio. Use the **Audio Training Score Average (sec)** drop-down menu to select an appropriate option.

You may change the option to display specific image on the screen with variable level of opacity proportional to the training score level. To do this:

1. Check the **Use feedback image** checkbox.
2. Select the image from the drop-down list (or a custom one by clicking on the **+** button).
3. You may choose to show the image only once the score reaches certain level by checking the **Start at score** option and entering the score threshold level.
4. You may apply an averaging filter to the training score that drives showing feedback images. Use the **Feedback Image Score Average (sec)** drop-down menu to select an appropriate option.

## 4.1.4.4. Subliminal Settings

When **Subliminal Settings** menu option is selected the following window opens:




Here, you may set various settings related to subliminal priming training method.

You may change the option to display specific subliminal (not clearly visible) image on the screen. To do this:

1. Check the **Use subliminal image** checkbox.
2. Select the image from the drop-down list (or a custom one by clicking on the **+** button).

Alternatively you may change the option to display specific subliminal (not clearly visible) text message on the screen. To do this:

1. Check the **Use subliminal text** checkbox.
2. Enter the subliminal message text in respective text entry field.

Along with either subliminal image or text you may choose to display a custom personal message visible on screen between subliminal priming. To do this:

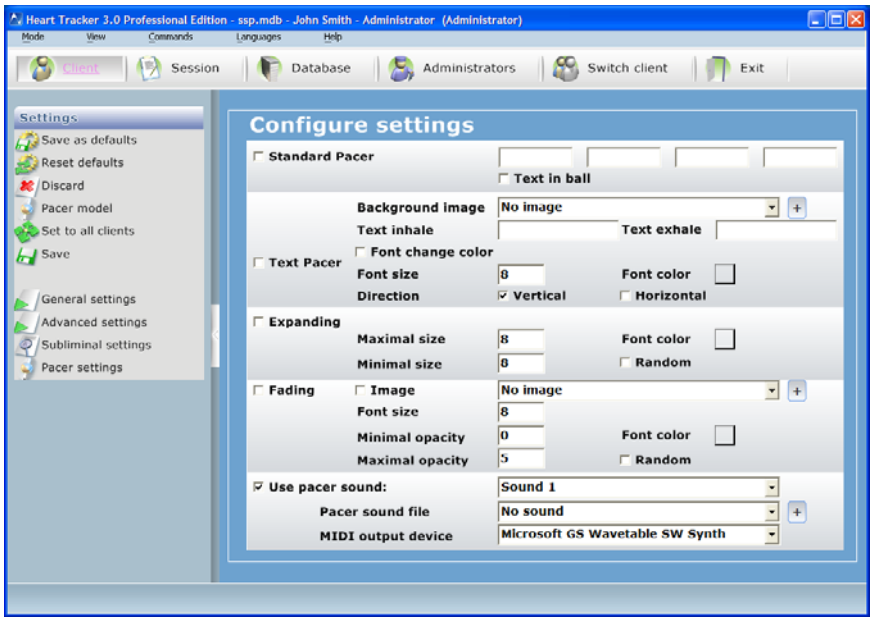
1. Check the **Use personal text** checkbox.
2. Enter the personal message text in respective text entry field.

Various settings can be determined for displaying the subliminal messages or images:

| | |
|---|---|
| **Delay (ms)** | Set delay time between displaying the personal message and subliminal priming. |
| **Text color** | Set color of the subliminal text by clicking the box and selecting an appropriate color from the palette. |
| **Subliminal background image** | Select the image to be displayed behind the subliminal messages or images from the drop-down list (or a custom one by clicking on the **+** button). |
| **Start at score** | Set this checkbox and enter the score threshold level to show the subliminal priming only once the score reaches certain level. |
| **Subliminal score average (sec)** | Set an averaging filter to the training score that drives subliminal priming. |
| **Random position** | Set this checkbox to display subliminal priming (image or text) at random position on the screen. |
| **Duration (ms)** | Set time interval during which subliminal priming is visible. |
| **Period (ms)** | Set period of presenting subliminal priming. |
| **Opacity (%)** | Set opacity of subliminal image or text ranging from 0 (invisible) to 100 (non-transparent). |

## 4.1.4.5. Pacer Settings

When **Pacer Settings** menu option is selected the following window opens:




Here you can customize various options of the visual breath pacer. The program provides the following pacer options:

- Standard pacer
- Moving text pacer
- Expanding text pacer
- Fading pacer

**Standard Pacer**

This pacer option is a ball moving up and down according to a pacer model described above.

The standard pacer is displayed in the same view along with other displays like graphs or images.

1. Check the **Standard Pacer** checkbox to choose this pacer option.

2. Input up to 4 words which correspond to 4 phases of the breath cycle and are shown below the pacer bar during the pacing process. The suggested words are "**Inhale**", "**Hold**", "**Exhale**" and "**Pause**".

3. Check the **Text in ball** checkbox to display those 4 words within the moving ball.

**Moving Text Pacer**

This pacer option is a text moving vertically or horizontally according to a pacer model described above.

The moving text pacer is displayed as an alternative view selectable by clicking the **Pacer Training** menu option.

1. Check the **Text Pacer** checkbox to choose this pacer option.
2. Select the **Background image** from the drop-down list (or a custom one by clicking on the **+** button).
3. Fill out the **Text inhale** and **Text exhale** data fields to specify text messages to be shown during inhalation and exhalation on the pacer screen.
4. Check the **Font change color** checkbox to enable changing the color of the pacer text along with the current score to one of the following colors: red, orange, yellow or green.
5. Set **Font size**.
6. Select **Font color** by clicking the color button and picking color from the color selector. This setting is ignored if **Font change color** is set.
7. Set **Direction** to **Vertical** or **Horizontal** by setting a respective checkbox.

**Expanding Text Pacer**

This pacer option is a text gradually changing the size of a text according to a pacer model described above. The text is expanding when inhaling and shrinking when exhaling.

The expanding text pacer is displayed as an alternative view selectable by clicking the **Pacer Training** menu option.

1. Check the **Expanding** checkbox to choose this pacer option.
2. Select the **Background image** from the drop-down list (or a custom one by clicking on the **+** button).
3. Fill out the **Text inhale** and **Text exhale** data fields to specify text messages to be shown during inhalation and exhalation on the pacer screen.
4. Set **Maximal size** and **Minimal size** to determine font size range for text expansion.
5. Select **Font color** by clicking the color button and picking color from the color selector.

6. Set **Random** checkbox to enable random position of the text for each breath cycle.

**Fading Pacer**

This pacer option is a text or image gradually changing its transparency according to a pacer model described above. The text or image becomes more opaque when inhaling and more transparent when exhaling.

The fading text pacer is displayed as an alternative view selectable by clicking the **Pacer Training** menu option.

1. Check the **Fading** checkbox to choose this pacer option.
2. Select the **Background image** from the drop-down list (or a custom one by clicking on the **+** button).
3. Fill out the **Text inhale** and **Text exhale** data fields to specify text messages to be shown during inhalation and exhalation on the pacer screen.
4. Set the **Image** checkbox if you want an image changing its transparency with the pacer instead of the text. If this option is set, select an image file from the drop-down list (or a custom one by clicking on the **+** button). In this case it is recommended not to select any background images to avoid mixing two different images.
5. Set **Font size** if fading text option is chosen.
6. Select **Font color** by clicking the color button and picking color from the color selector. This option is valid if fading text option is chosen.
7. Set **Random** checkbox to enable random position of the text or image for each breath cycle.
8. Set Minimal opacity and Maximal opacity options between 0 (invisible) and 100 (fully opaque).

**Pacer Sound Options**

Set the **Use pacer sound** checkbox to enable special MIDI sounds used for the breath pacer. Select one of the MIDI presets from the dropdown list.

You may choose a custom **Pacer sound file** by selecting it from the drop-down list (or a custom one by clicking on the **+** button.

If your PC has different types of MIDI-playing virtual devices you may choose the right one using the **MIDI Output Device** drop-down menu.

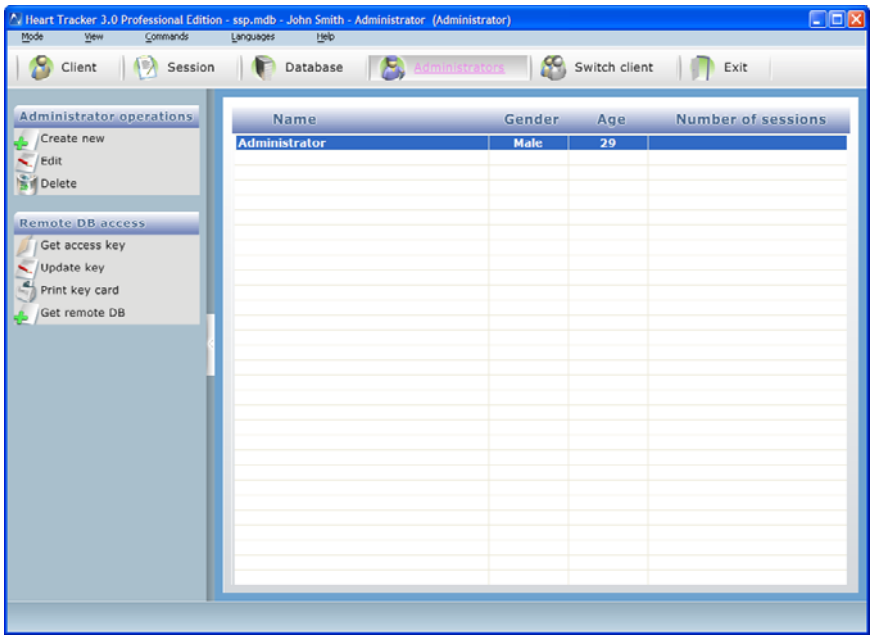
### 4.1.5. Select All

Clicking on the **Select All** menu option in the User Operations Menu highlights all existing user profiles.

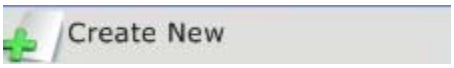
This operation is helpful in case you want to delete all users from the database.

## 4.2. Administrator Operations

Click on the **Administrators** button of the top menu to switch to administrator operations mode. This will bring the following window:




The Administrator Operations Menu is on the left side of the screen. Here, you have the following options:




Create a new administrator profile.

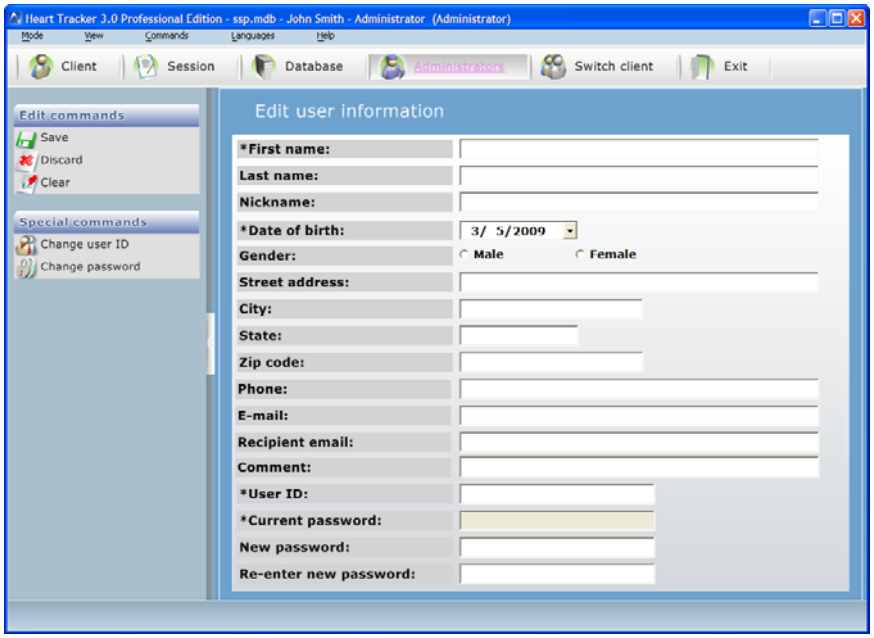
View / edit an existing administrator profile.

Delete an existing administrator profile.

## 4.2.1. Creating New Administrator

As an administrator you can create another administrator record giving him/her the same privileges you have with regard to working with this system.

Click on the **Create New** menu option to open the following form.




Enter your data into each field. The required fields are marked with an asterisk.

Upon completion of this form, you have several options:

1. You may choose to save the current information by pressing the **Save** menu option.
2. You may clear the form and start again using the **Clear** menu option.
3. You may press the **Discard** menu option to cancel this operation and return to the system login.

It is recommended to enter a new password in the administrator's record being created to increase level of data privacy. Type in a new password and re-type it to confirm it in the **New Password** and **Re-enter New Password** fields.

## 4.2.2. Editing Administrator Information

Once you select the **Edit** menu option in the Administrator Operations Menu the administrator information form will open. You can modify the administrator's information as described in the previous section.

You may change the User ID by clicking the **Change User ID** menu option and entering new User ID.

You may change a user password by doing the following steps:

1. Click on the **Change Password** menu option.
2. Type in the current password into the **Current Password** field. If you have no password, leave the field blank.
3. Type in a new password and re-type it to confirm it in the **New Password** and **Re-enter New Password**.

## 4.2.3. Deleting an Existing Administrator

To delete an existing administrator highlight the profile in the list that you wish to delete then click on the **Delete** menu option in the Administrator Operations Menu.

A dialog box will open and warn you that the selected administrator records and session data are about to be deleted. If you wish to proceed choose **Yes**.

**Important!** Deleting record will permanently destroy all data previously recorded in this record.

## 4.2.4. Remote Client Data Access

The Heart Tracker 3 Pro provides you with a unique capability to access training session data acquired by AWS Heart Wizard home training system.

You can encourage your clients to use this home training tool to do breathing exercise training at home and have remote access to that data to see how your clients are doing with their home training.

The Heart Wizard is an Internet based product, which means that your client's home training data is stored on remote Internet server. So you need to be able to connect to that server and access your client's data. This requires your PC to be connected to the Internet.

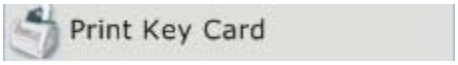
Here is how it works:

1. Once your client agrees to give you an access to his/her training data, you have to give your client a special unique access key.
2. Your client must enter that key into his/her personal information record in respective data field and update that record. The Heart Wizard system will then know that you are given permission to access this client's records.
3. You need to get access to that remote database and establish a link with it. The Heart Tracker 3 Pro will remember that remote database and add it to the list of databases under your control.
4. Any time you want to access your client's home training data you would need to open that remote database and access session data as if it is in your Heart Tracker 3 Pro here.

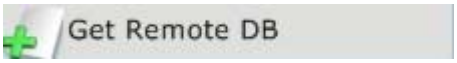
The Remote DB Access Menu is on the left side of the screen. Here, you have the following options:

Generate new access key.

Update your current access key.



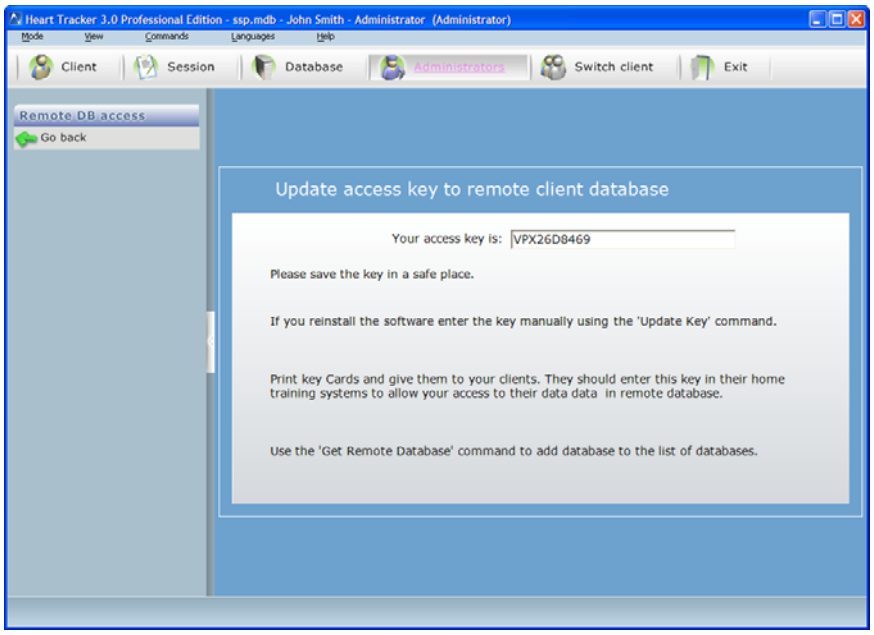

Print a special memo card with your access key to give to your client.




Access AWS remote database and establish a link with it.

## 4.2.4.1. Get New Access Key

Click on the **Get Access Key** menu option to generate new access key. The following form will appear:




You can manually edit this key.

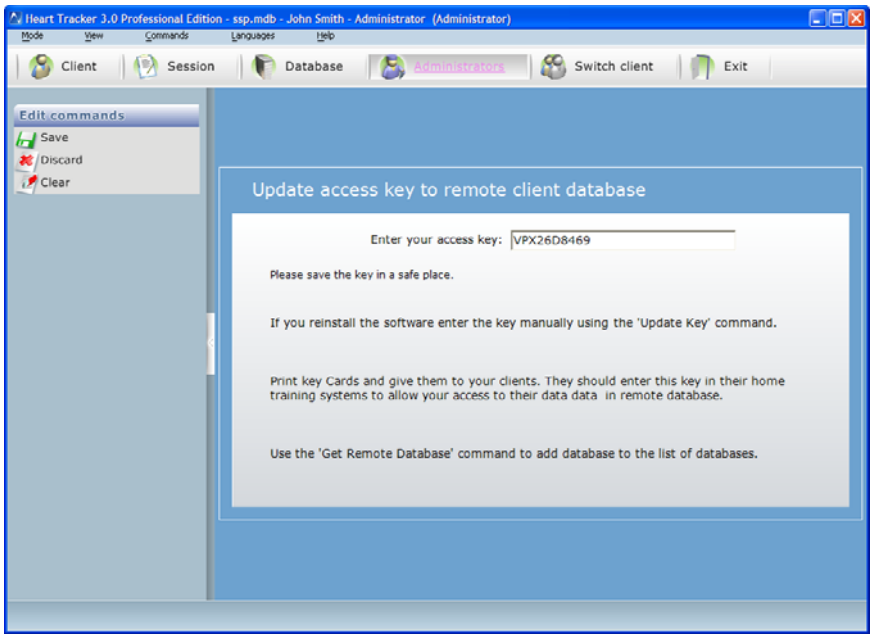
Click on the **Save** menu option to store the key.

Click on the **Discard** menu option to cancel updating the key.

Click on the **Clear** menu option to empty entry fields.

## 4.2.4.2. Update Access Key

Click on the **Update Key** menu option to modify your current access key. The following form will appear:




You can manually edit this key.

Click on the **Save** menu option to store the key.

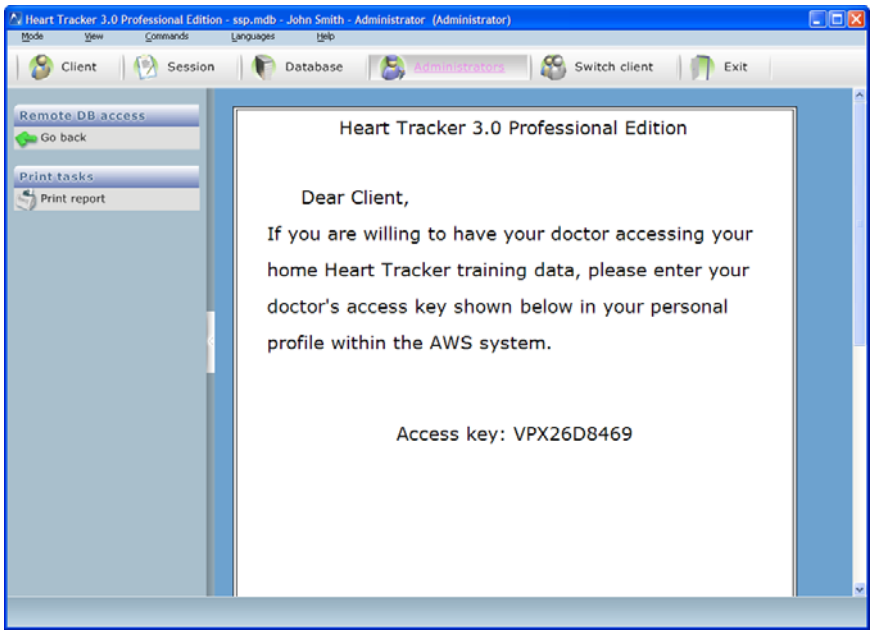
Click on the **Discard** menu option to cancel updating the key.

Click on the **Clear** menu option to empty entry fields.

**Important:** Be careful with modifying your access key. If it is changed all your clients who have been given your old key will have to get this new one and update their Heart Wizard personal information record to allow you accessing their home training data.

## 4.2.4.3. Print Access Key Card

Click on the **Print Key Card** menu option to print a special access key card, which must be given to all your clients to which home training data you want to have access to. The following form will appear:

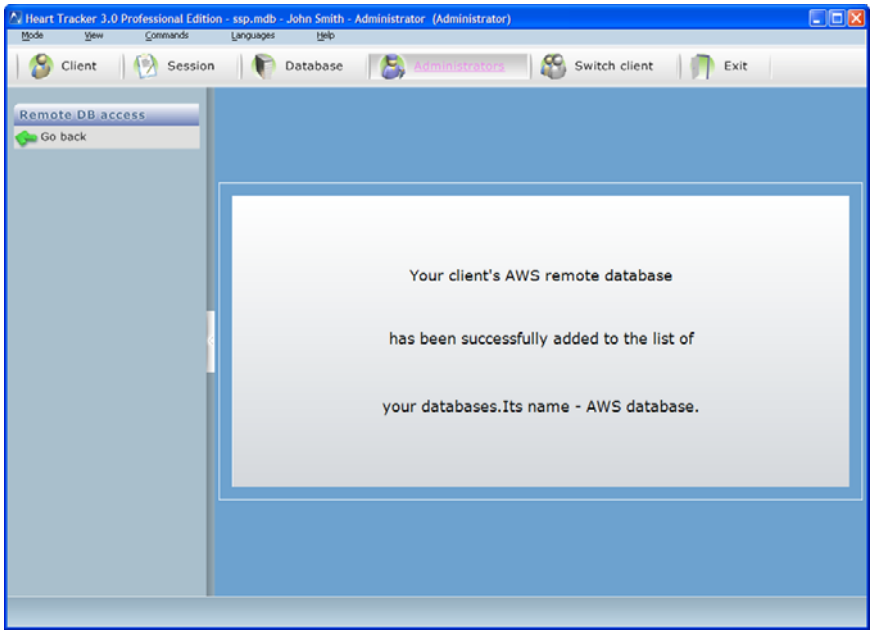



Click on the **Print Report** menu option to print the card.

Click on the **Go Back** menu option to return to the previous screen.

## 4.2.4.4. Link to Remote Database

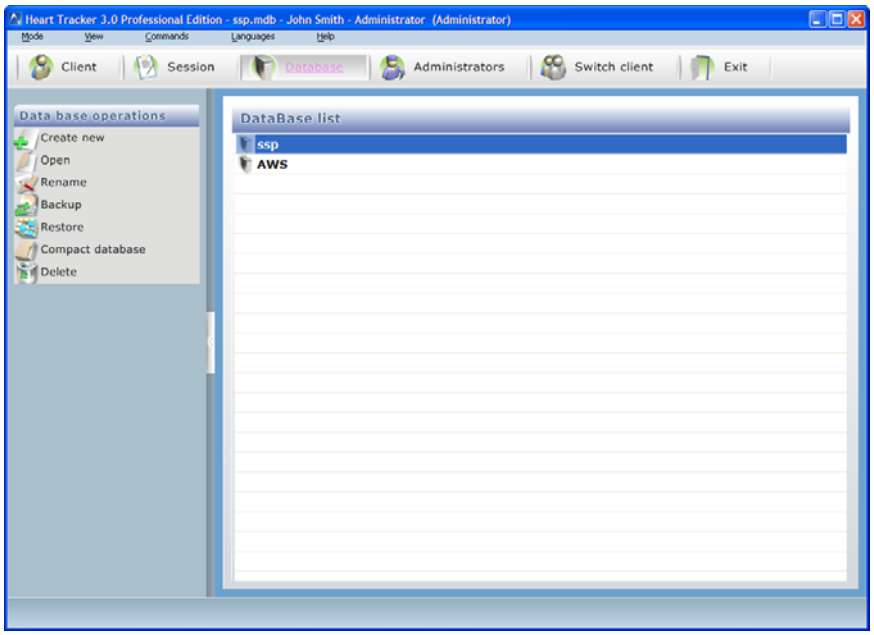
Click on the **Get Remote DB** menu option to establish a link with AWS remote database. Upon completion the following form will appear:



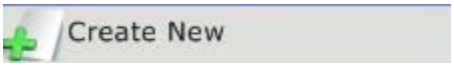
Click on the **Go Back** menu option to return to the previous screen.

## 4.3. Database Operations

Click on the **Database** button of the top menu to switch to database operations mode. This will bring the following window:




The Database Operations Menu is on the left side of the screen. Here, you have the following options:




Create new database.

Open selected database.

Rename selected database.

Backup selected database.

Restore selected database from its backup copy.

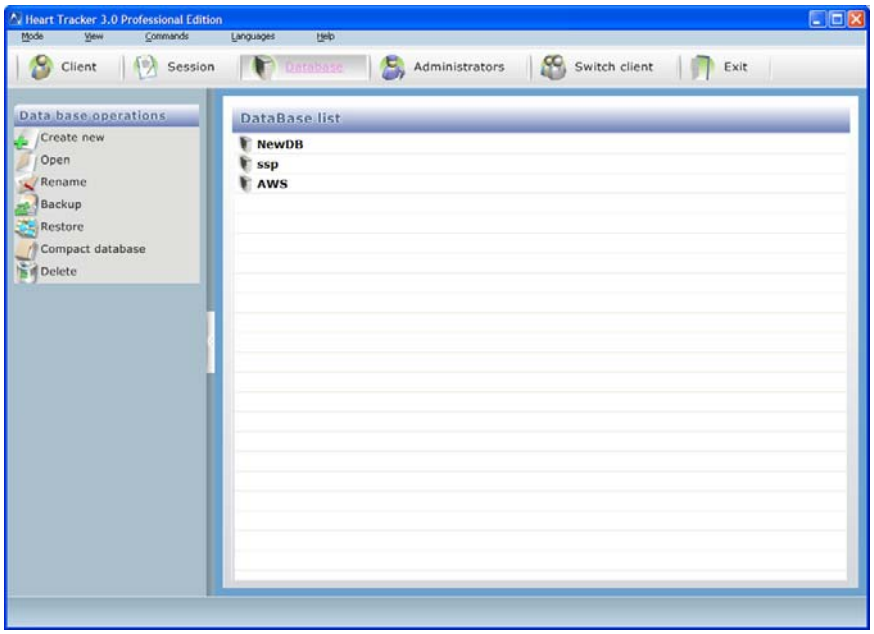
Compact selected database.

Delete selected database.

## 4.3.1. Creating New Database

As an administrator you can create multiple databases. This could be very helpful if you wish to separate different groups of your clients.

Click on the **Create New** menu option to create new database. A new database named **NewDB** will be automatically created and added to the list of databases:

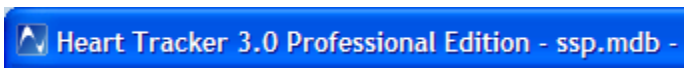



It is recommended to rename this new database to assign more meaningful name to it.

## 4.3.2. Opening Database

Select specific database from the list of databases then click on the **Open** menu option to open it.

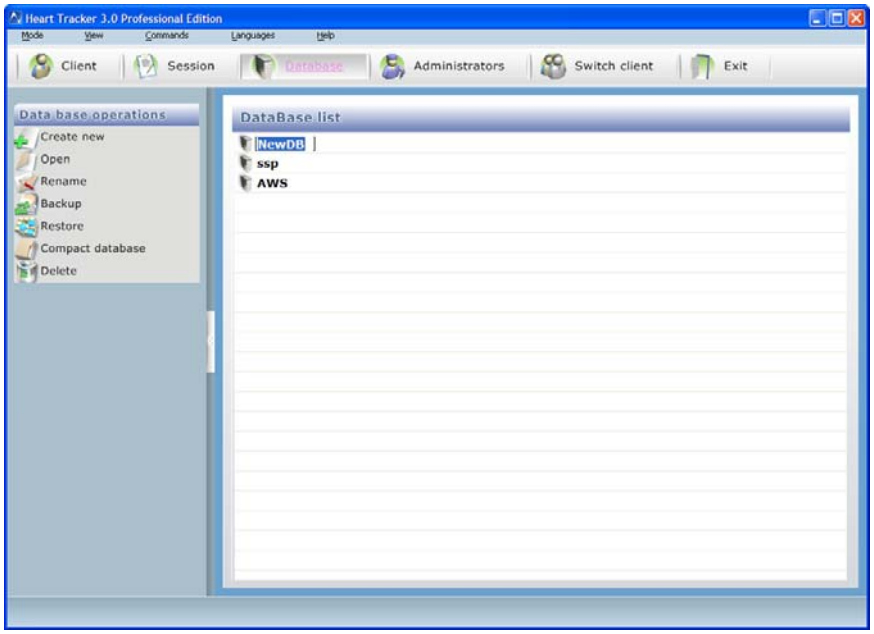
Once selected database is open its name will appear on the program caption bar to the right of the software name.



## 4.3.3. Renaming Database

Select specific database from the list of databases then click on the **Rename** menu option to rename it.

The name of selected database in the list becomes editable:



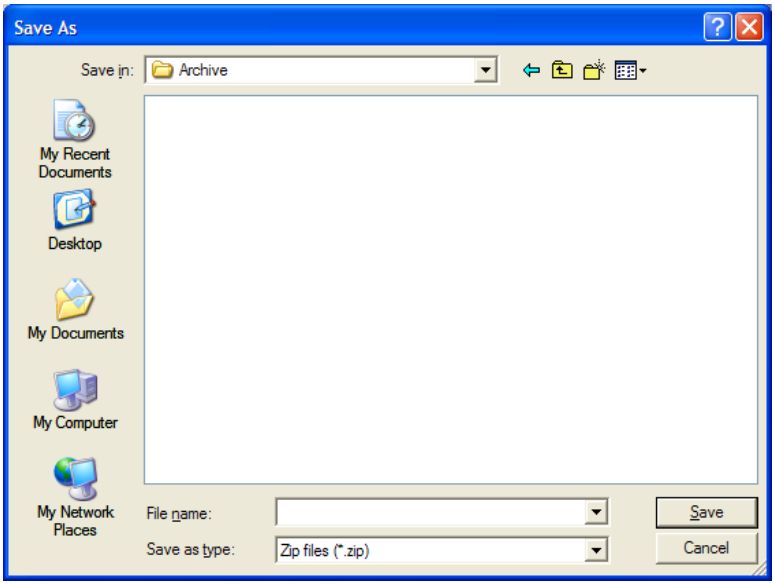

Modify the name of the selected database and hit <Enter> to complete it. This should display new name in the list in non-editable format.

**Important:** Do not rename the "AWS" database because it is very special name representing the remote Heart Wizard database.

## 4.3.4. Backing Up Database

Select specific database from the list of databases then click on the **Backup** menu option to back it up.

The following dialog box will appear:

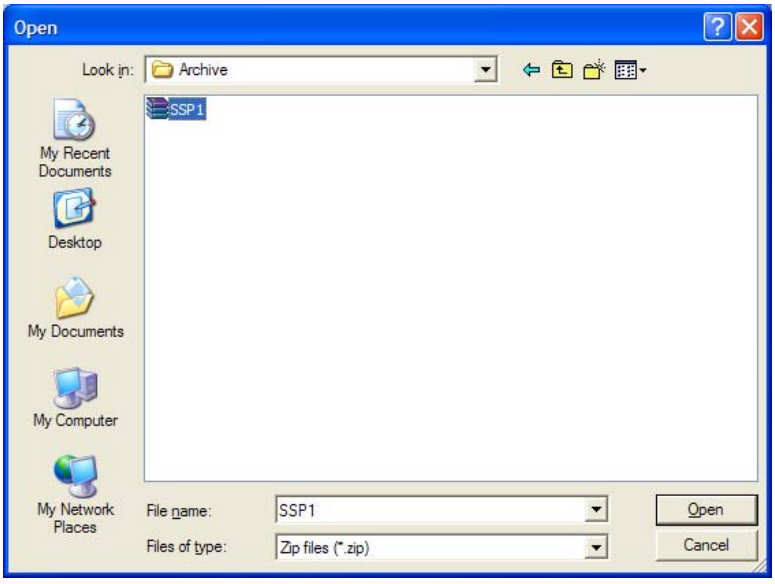



Enter backup file name and click the **Save** menu option to complete backup process.

## 4.3.5. Restoring Database

If you created a backup file of any of existing or previously existed databases you can restore that database from its backup copy.

Click on the **Restore** menu option. The following dialog box will appear:




Select desired backup file name from the list and click the **Open** menu option to complete restoring the database.

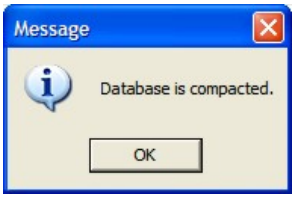
The database will be restored with its original name.

## 4.3.6. Compacting Database

You may compact selected database by clicking on the **Compact Database** menu option.

This feature searches through your database and deletes any old records that have already been deleted from the summary list.

Upon completion of compacting process the following message will be displayed:




## 4.3.7. Deleting Database

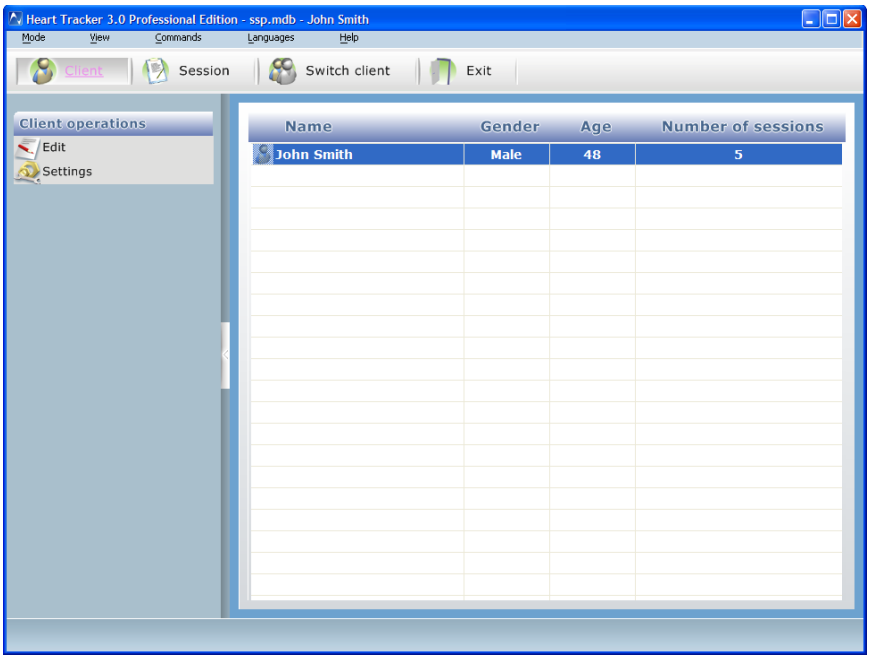
Highlight the database name in the list that you wish to delete then click on the **Delete** menu option in the Database Operations Menu.

A dialog box will open and warn you that the selected database and all data in it are about to be deleted. If you wish to proceed choose **Yes**.

**Important!** Deleting database will permanently destroy all data stored in it.

# 5. Non-administrative User Operations

Once non-administrative user logs in, the following window will open:




## 5.1. Non-administrative User Main Menu

The top menu has the following options:

Manage client personal information.

Manage session records.

Switch to another user by logging off current one and logging on another.

Exit the software.

Click the selected menu item to perform specific program task.

# 5.2. Client Operations

Click on the **Client** button of the top menu to switch to client operations mode. This will bring the list of clients shown above.

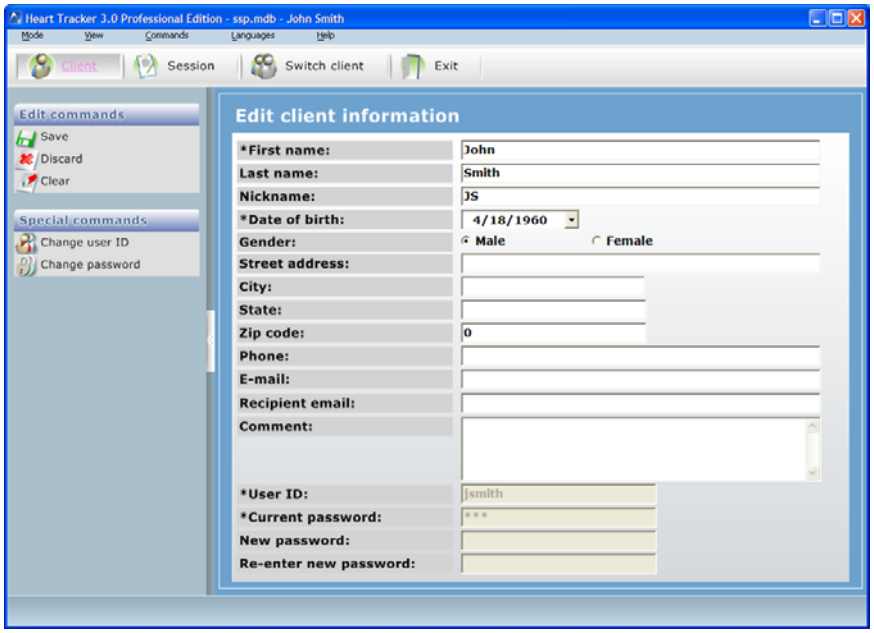
The Client Operations Menu is on the left side of the screen. Here, you have the following options:

View / edit an existing client profile.

View / edit program settings associated with this client.

## 5.2.1. Editing Client Profile

You may edit your own profile by clicking on the **Edit** menu option. The following window opens:




Enter your data into each field. The required fields are marked with an asterisk.

Upon completion of this form, you have several options:

1. You may choose to save the current information by pressing the **Save** menu option.
2. You may clear the form and start again using the **Clear** menu option.

3. You may change the User ID by clicking the **Change User ID** menu option.
4. You may add or change a user password by clicking on the **Change Password** menu option.
5. You may press the **Discard** menu option to cancel this operation and return to the system login.

To change the user password, click on the **Change Password** menu option and type in the current password into the **Current Password** field. (If you have no password, leave the field blank)

Type in a new password and re-type it to confirm it in the **New Password** and **Re-enter New Password** fields.

## 5.2.2. Editing User Settings

You may edit your individual settings and preferences by clicking on the **Settings** menu option.

The details on this option are identical to such option available to administrative user and described in previous section.

# 6. Running a New Training Session

## 6.1. Training Goals

The main goal of the training provided by Heart Tracker 3 Pro is to stimulate your baroreflex mechanism and "exercise" your parasympathetic nervous system. Refer to the description above for details on the physiological background of this process.

Deep and paced breathing must be used for stimulating baroreceptors and inspire a response of your parasympathetic nervous system resulting in HR oscillations synchronous with breath cycle. These oscillations in HR are also called RSA waves. So the goal of this training session is to achieve high amplitude RSA waves and keep them high throughout the entire session.

Please stay focused on keeping breathing according to the breath pacer to generate best RSA waves possible. Loss of focus in paced breathing will cause loss of synchronicity and decrease of RSA waves, which means a decrease of the stimulation of the parasympathetic nervous system.

## 6.2. Training Means

Heart Tracker 3 Pro employs breath cycle patterns as a tool to trigger, generate and maintain RSA waves. A specific breath cycle pattern is presented as a breath pacer you must follow. The software allows you to create various breath cycle patterns by means of setting specific breathing rates.

## 6.3. Training Protocol

The Heart Tracker 3 Pro provides several simple training protocols:

- 5 minutes training
- 10 minutes training
- 15 minutes training
- Unlimited time training

Each training session starts with a data accumulation phase when physiological data is being accumulated for proper calculations. You can choose different options of accumulation time. The shorter accumulation time is the sooner you will begin getting the training score to show up. However the shorter accumulation time the less sensitive the score will be to small changes in smoothness (coherence) of heart rate oscillations caused by paced breathing (also known as RSA waves).

Once the accumulation phase is over, the software starts calculating a key parameter called the **Current Score** (also referred as **Training Score**, **RSA Score**). This calculation is based on using a patented algorithm that evaluates oscillations of HR data to quantitatively measure the strength of your RSA waves created in response to paced breathing.

By default, the software automatically enables the breath pacer upon starting the session. You have to follow the pacer throughout the session. However the software will start showing the Current Score only upon preset accumulation time elapses. So do not be discouraged when you don't see the score values at the beginning of the session.

The height of the breath pacer bar does not represent the volume of your breathing. It is only there to demonstrate what rhythm your breathing pattern should take. Adjust your actual breathing volume to a comfortable level (to avoid hypo- or hyperventilation).

Once the training phase is over, the software automatically brings up a session summary. Then session data can be either saved to your record or discarded.

# 6.4. Start Training Session

Before starting a new training session:

If you have a pulse wave sensor option:

1. Have your pulse wave sensor connected to PC.
2. Hook up your ear-clip.

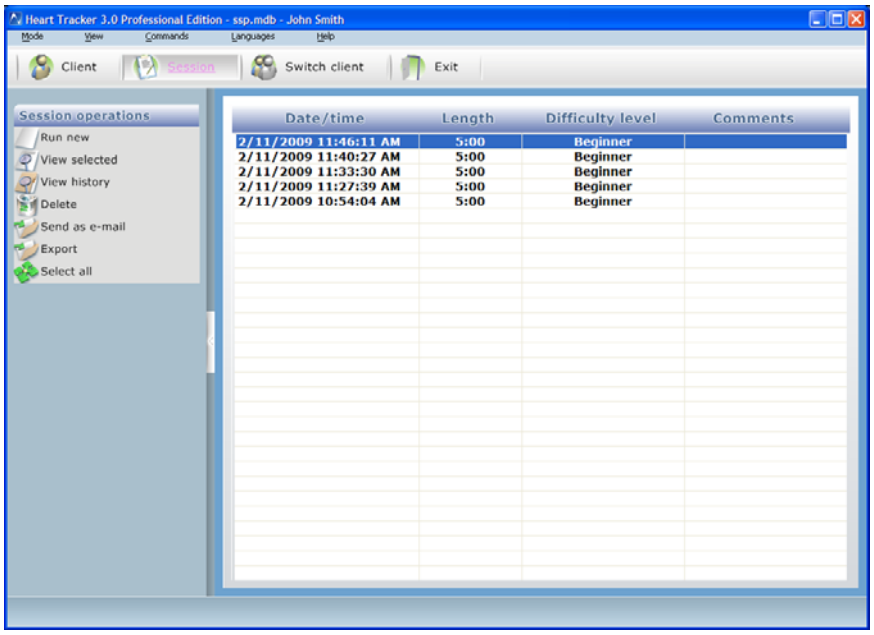
If you have an ECG recorder option:

1. Have your ECG recorder connected to PC.
2. Hook up your ECG leads (and respiration sensor if available).

Then:

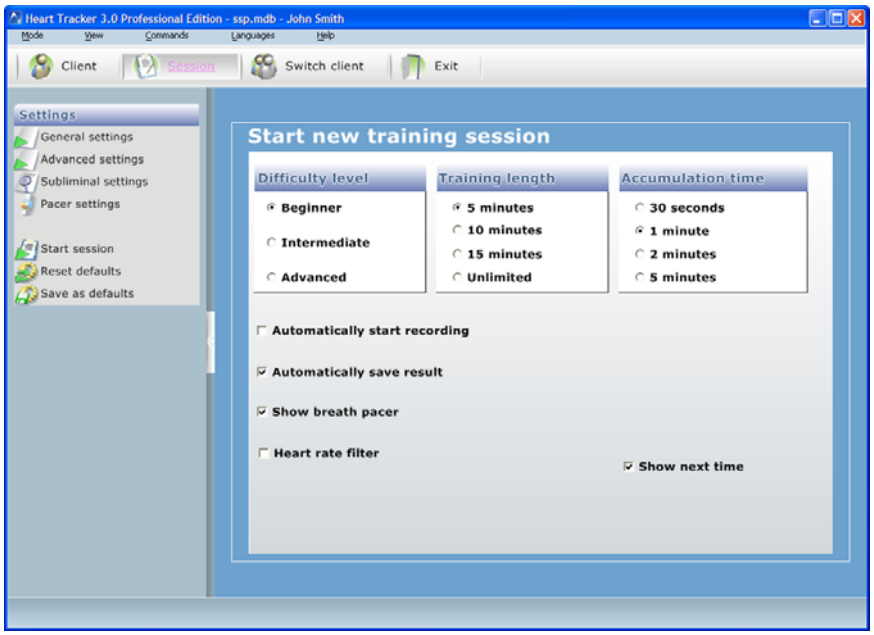
3. Start the Heart Tracker 3 Pro software and bring its main menu.
4. Click on the **Session** menu option.

The following window appears:




Click on the **Run New** menu option in the Session Operations menu on the left panel.

The following dialog will appear:




This dialog is shown by default. However if you use the same settings from session to session, it would be OK to skip it when starting a new session. To skip it next time uncheck the **Show Next Time** checkbox.

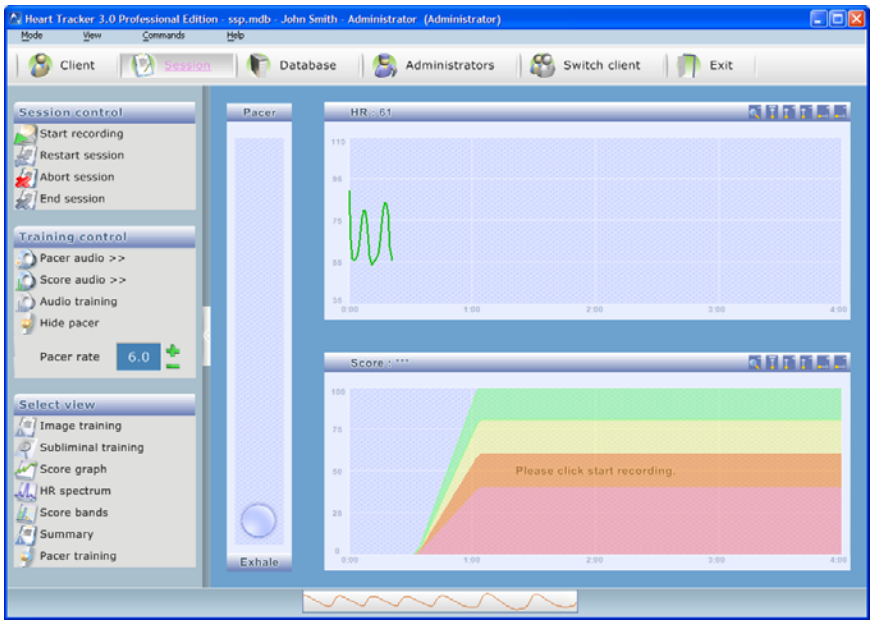
Once you uncheck the **Show Next Time** checkbox it will not appear when starting new training session anymore. However you may access these options in the Client Menu by clicking on the **Settings** menu option.

You may change any settings in this dialog as it was described in the **Settings** section.

Click on the **Reset Defaults** menu option to set all configuration parameters to their factory preset values.

Click on the **Save as Defaults** menu option to save your current settings as default settings for future use.

Once you configured the new training session click on the **Start Session** menu option to begin the training. The following main training window appears:




**Note:** If you use the Biocom 3000 ECG recorder with a respiration sensor option an additional red line will be shown on the graph to indicate breathing activity.

Make sure to synchronize your breathing pattern with the pacer to achieve the best results.

The session will automatically finish once preset training time elapses.

**Important!** If you chose the **Unlimited** duration option, the session will run indefinitely until you click the **Stop Session** menu option.

Make sure you are getting stable readings of HR data then click this menu option to start the training session.

**Note:** It is not necessary to click on this menu option to begin session recording if **Automatically start recording** option was enabled in the program settings.

# 6.5. Program Controls and Features

## 6.5.1. Controlling the Session Process

If for some reason the quality of the pulse wave (or ECG) signal significantly decreases so it causes the HR to become unstable (typically jumping unrealistically high and / or low), this makes your session data of little value. When this happens it is recommended to restart the session.

Click this menu option to stop the session and automatically start it over.

**Important!** All of your data collected during the session will be permanently lost when you restart the session.

If for some reason you cannot successfully continue your current training session, you can terminate it.

Click on this menu option to terminate the session. The program will prompt you to confirm you are willing to terminate the session.

**Important!** All your data collected during the session will be permanently lost when you restart the session.

Click on this menu option to stop the session, but save the data collected.

There are two indicators at the bottom of the training screen:

This indicator shows how the current session is progressing.

This indicator shows your pulse wave

OR

ECG trace.

## 6.5.2. Adjusting the Graph Scales

At the top right corner of each of the two graphs, there is a series of buttons that adjust the scale of the graph.

This button maximizes and minimizes the graph.

This button automatically adjusts the vertical (amplitude) scale of the graph.

This button increases the vertical (amplitude) scale of the graph.

This button decreases the vertical (amplitude) scale of the graph.

This button increases the horizontal (time) scale of the graph.

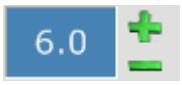
This button decreases the horizontal (time) scale of the graph.

## 6.5.3. Controlling the Breath Pacer

The Heart Tracker 3 Pro has extensive means to use the breath pacer.

### 6.5.3.1. Adjusting Pacer Rate

You can adjust the breath pacer rate to accommodate your training exercise to your needs. Although in most cases 6 breaths per minute pacer rate is used as a default rate you can change it to lower or higher rates with ease.




Use the **+** and **–** controls to adjust the breath rate.

The adjustment takes effect immediately.

This pacer rate adjustment can only be made before session recording starts. Once it is started, this control becomes disabled. If **Automatically start recording** option was enabled in the program settings this control will be disabled all the time, so proper pacer rate adjustment has to be made in the User Settings.

## 6.5.3.2. Showing / Hiding the Breath Pacer

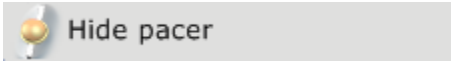
The Heart Tracker 3 Pro provides two types of visual breath pacers:

1. Standard pacer
2. Training pacer

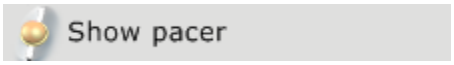
The standard pacer is a ball moving up and down along with breath cycle. It is displayed in a separate window embedded in the program main window. It can be shown along with other graphs or diagrams.

The training pacer is an alternative type of view, which replaces your current standard view (standard pacer and graphs). So with the training pacer you can focus on paced breathing.

When standard pacer is shown on screen you can control its visibility.




Click on this menu option to hide the standard pacer.

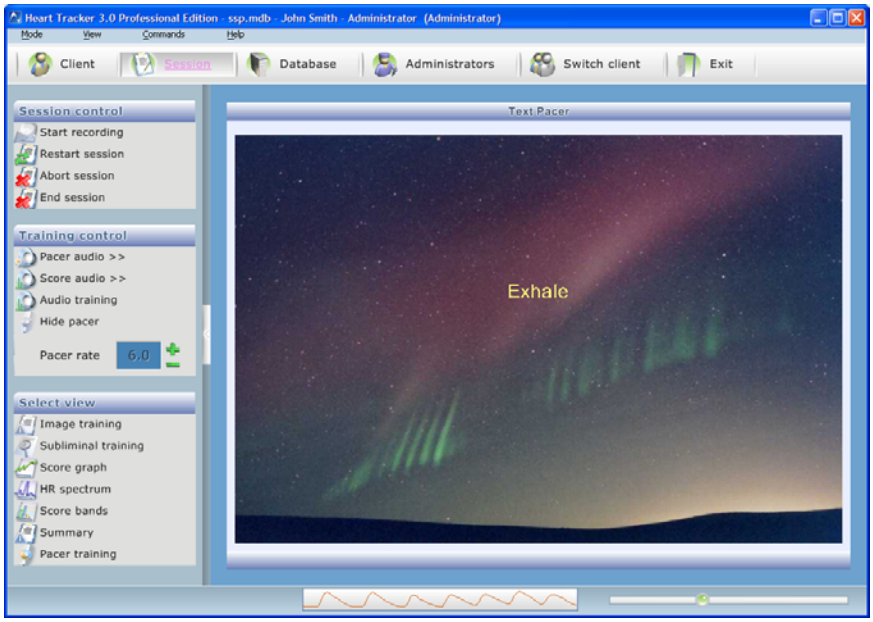



Click on this menu option to show the standard pacer.

## 6.5.3.3. Using Pacer Training

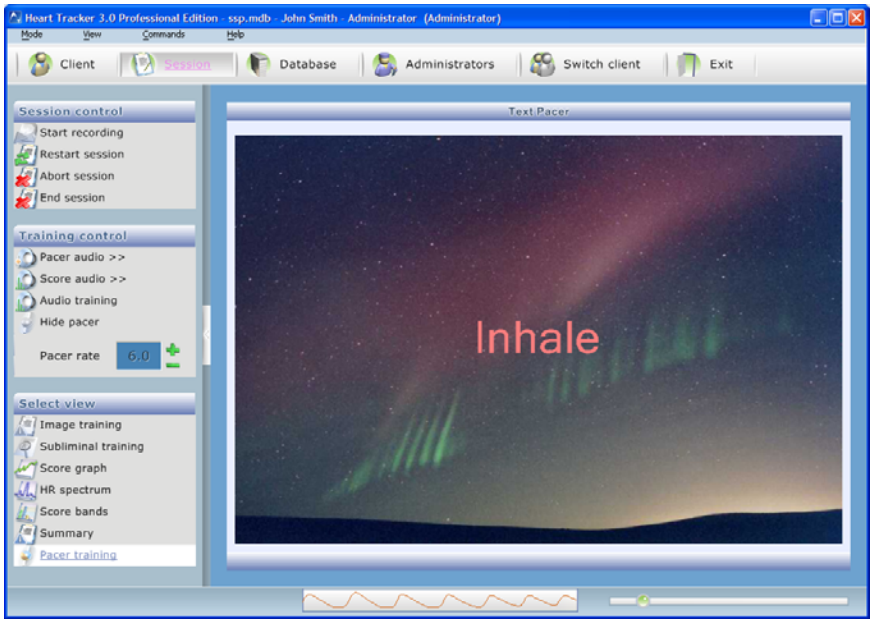
If you configured any non-standard pacer in the program settings you can switch to the pacer training view by clicking on this menu option.

If text pacer is configured as a training pacer option, the following window opens:



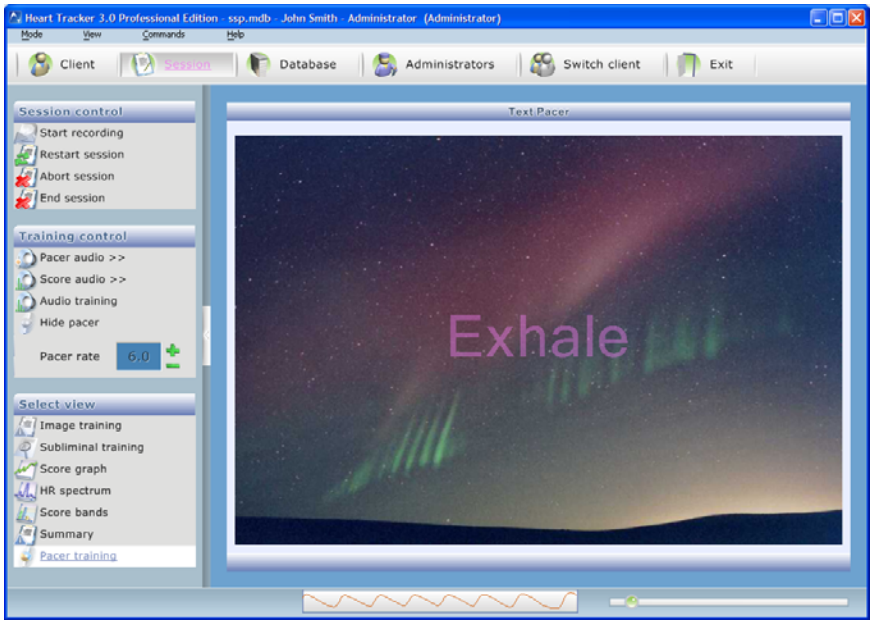

The text will move up and down or left and right according to breath cycle depending on specific settings.

If expanding text pacer is configured as a training pacer option, the following window opens:



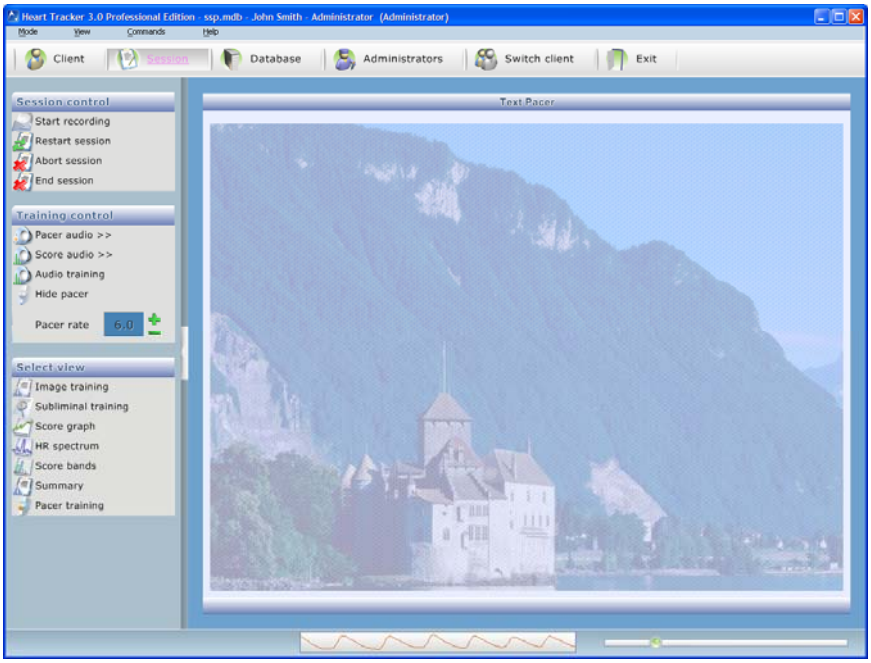

The text will expand and shrink according to breath cycle depending on specific settings.

If fading text pacer is configured as a training pacer option, the following window opens:




The text will fade in and out according to breath cycle depending on specific settings.

If fading image pacer is configured as a training pacer option, the following window opens:




The image will fade in and out according to breath cycle depending on specific settings.

## 6.5.4. Controlling Audio Features

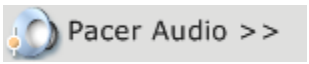
The Heart Tracker 3 Pro provides the following types of auditory feedback:

1. Breath pacer audio
2. Training score audio
3. Audio training

The breath pacer audio is a set of continuously changing musical tones (MIDI) or a specially selected audio (WAV or MP3) file, which represent audible breath pacer model.

It provides auditory distinguishable phases of the breath cycle, so you can intuitively sense the breath pacer without looking at the visual breath pacer bar.

You may select different pacer audio schemes in the settings window before you start your session.




Click this menu option to turn the audible breath pacer on.

Click it again to turn it off.

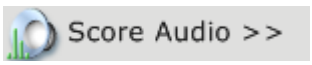
The training score audio is a set of preconfigured audio files (WAV, MP3), which are played when current training score hits into one of four score ranges:

- Low
- Medium
- High
- Superb

A separate audio file is associated with each score range. This association can be set in the program settings.

The audio file is played once when score value crosses threshold between two adjacent score ranges.

You may select different score audio schemes in the settings window before you start your session.




Click this menu option to turn the score audio on.

Click it again to turn it off.

The training audio is another auditory feedback feature allowing for playing a selected audio file (WAV or MP3) once specific training event occurs.

When the training score achieves a preset level, it triggers playing the selected audio file. If the score drops below this threshold level before the file playback is completed it will stop playing. Once the score is again above that level the audio will either continue playing the file or restarts it depending on specific settings.

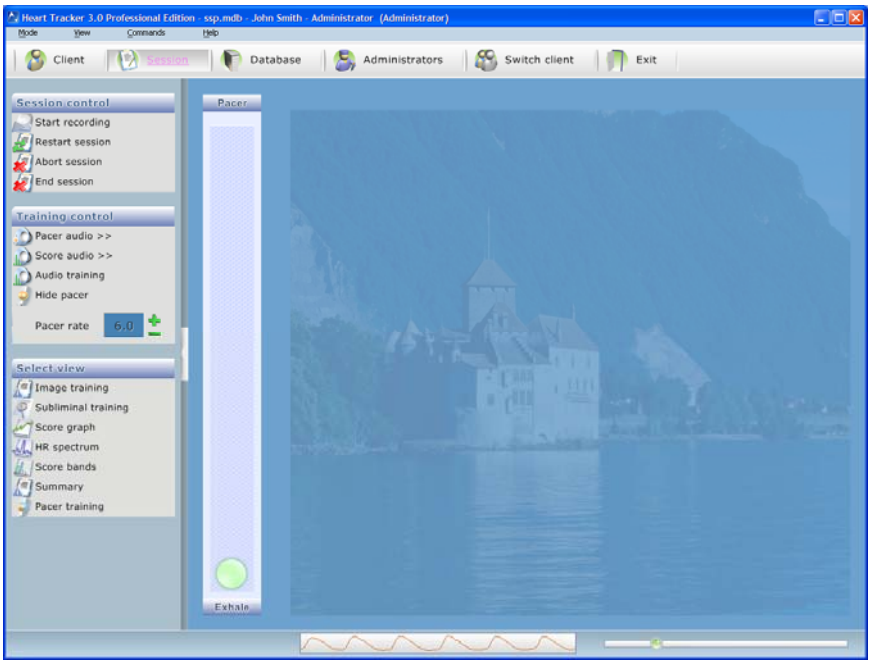
## 6.5.5. Changing Views

Heart Tracker 3 Pro provides several types of data views during the training session:

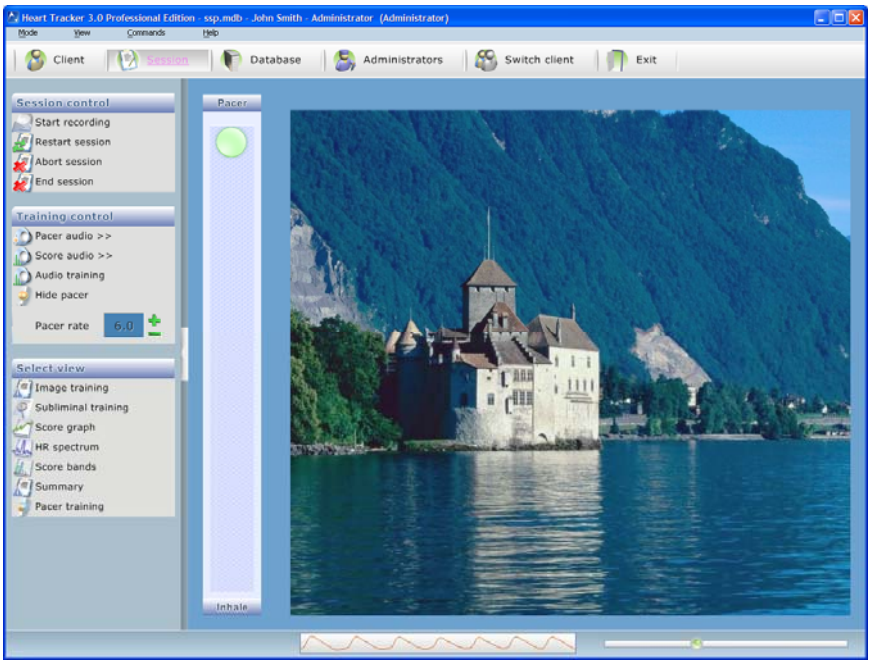
| | |
|---|---|
| Image training | Shows selected image gradually revealing along with increasing the training score.<br>*This menu item is shown only if this feature is enabled in the program settings.* |
| Subliminal training | Shows subliminal message (or image) over background image mask.<br>*This menu item is shown only if this feature is enabled in the program settings.* |
| Score Graph | Shows heart rate and training score graphs. |
| HR Spectrum | Shows heart rate graph and its power spectrum. |
| Score Bands | Shows heart rate graph and score distribution chart. |
| Summary | Shows preliminary training summary graphs including heart rate graph, score graph, power spectrum and score distribution chart. |
| Pacer training | Shows a pacer training view as described in the previous section. |

### 6.5.5.1. Image Training View

Click on the **Image Training** menu option to see the following view:




The transparency of the image depends on current training score. The lower score is the less visible the image is.

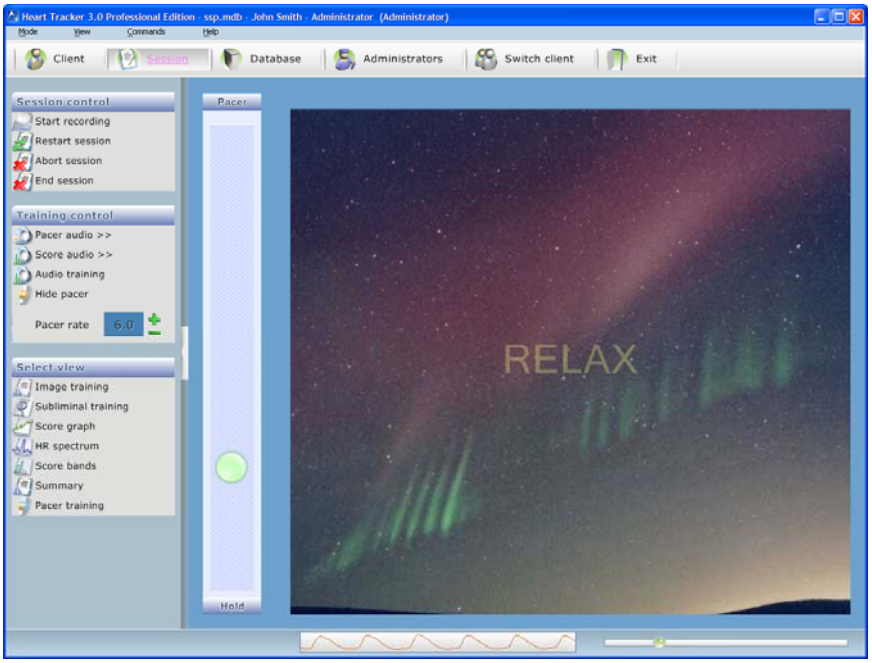



You can configure this screen by choosing the images you like.

The image will start showing up once your score reaches a preset level.

## 6.5.5.2. Subliminal Training View

Click on the **Subliminal Training** menu option to see the following view:

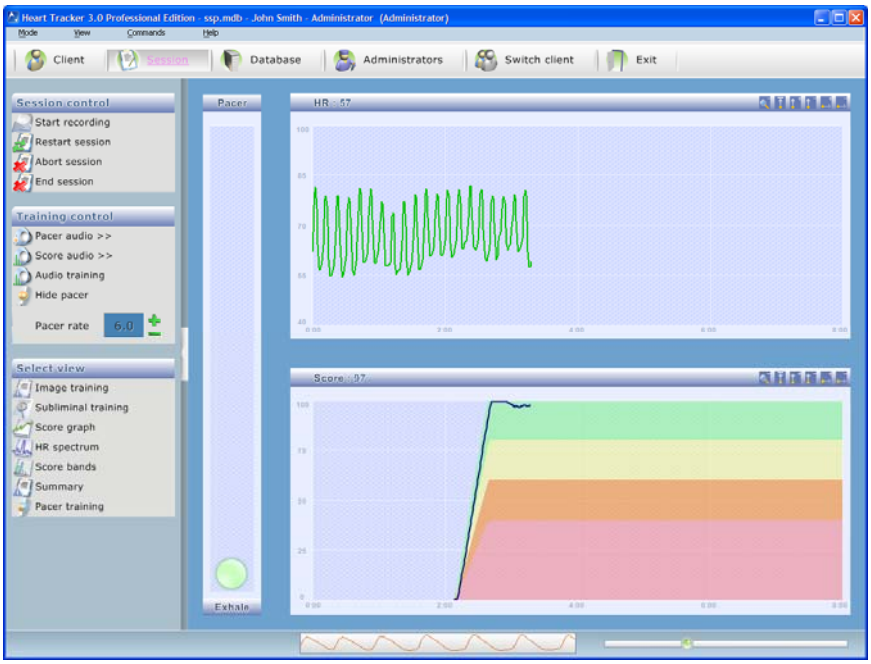



A specially configured text message or small image will be displayed for a very short period of time to pass you a non-visible specific subliminal message.

The subliminal message will start showing up once your score reaches a preset level.

## 6.5.5.3. Score Graph View

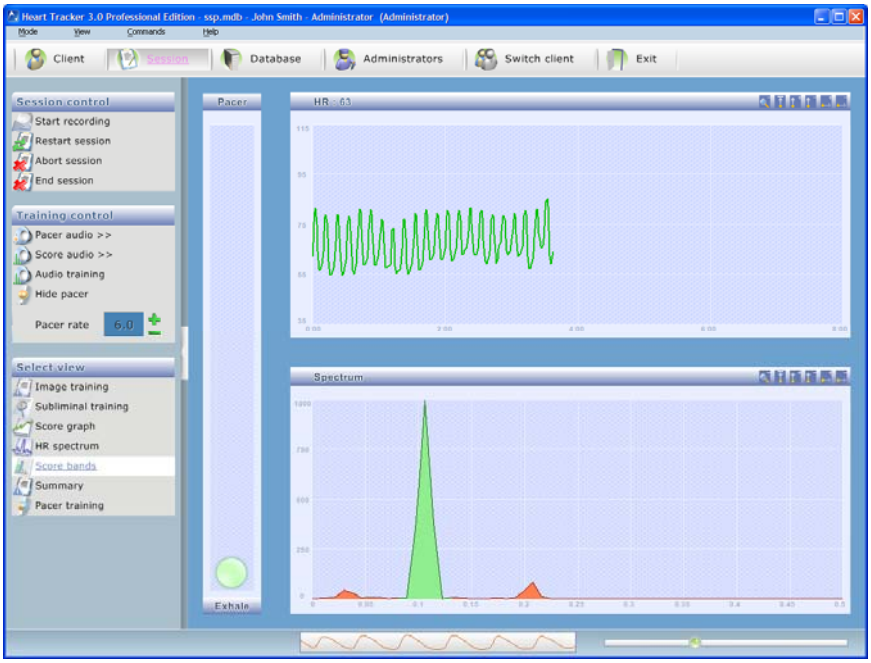
Click on the **Score Graph** menu option to see the following view:




**Note:** If you use the Biocom 3000 ECG recorder with a respiration sensor option an additional red line will be shown on the graph to indicate breathing activity.

## 6.5.5.4. HR Spectrum View

Click on the **HR Spectrum** menu option to see the following view:

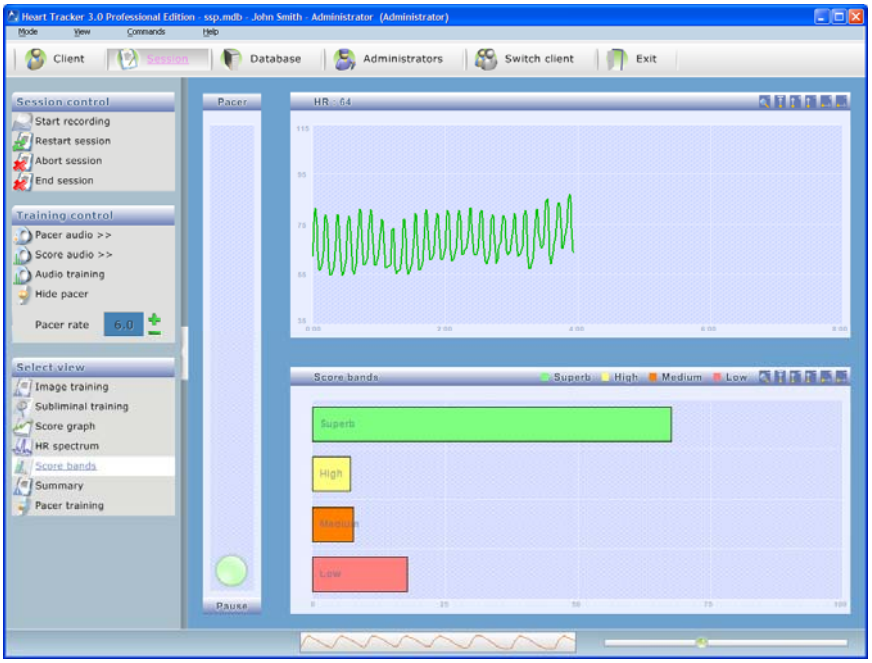


The lower graph shows a power spectrum of the heart rate data being collected. A high peak in the green zone of horizontal frequency scale indicates that high level of breathing modulation in heart rate has been achieved due to paced breathing.

**Note:** If you use the Biocom 3000 ECG recorder with a respiration sensor option an additional red line will be shown on the graph to indicate breathing activity.

## 6.5.5.5. Score Bands View

Click on the **Score Bands** menu option to see the following view:

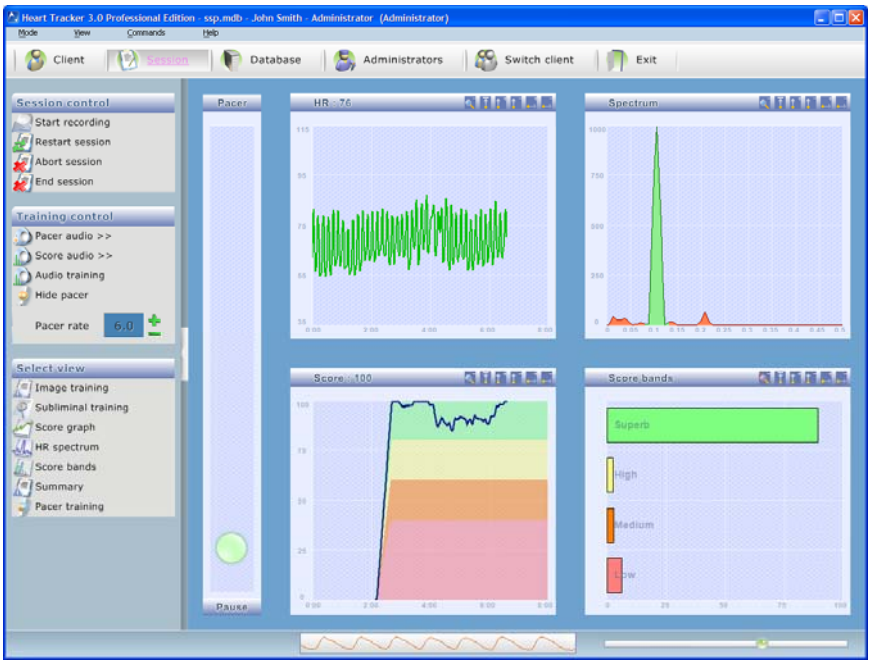



The lower graph shows a distribution chart of the training score among four main score bands. This distribution represents a portion of overall training time when score was within specific band.

**Note:** If you use the Biocom 3000 ECG recorder with a respiration sensor option an additional red line will be shown on the graph to indicate breathing activity.

## 6.5.5.6. Summary View

Click on the **Summary** menu option to see the following view:




**Note:** If you use the Biocom 3000 ECG recorder with a respiration sensor option an additional red line will be shown on the graph to indicate breathing activity.

## 6.6. Finishing the Training Session

If you selected the training protocol of limited duration Heart Tracker 3 Pro will automatically finished the session once the specified duration is elapsed.

Use the **Abort Session** menu option if for some reason you have to finish your training session before session automatically finishes. No session data will be stored in the user record. You will be brought to the user's home screen.

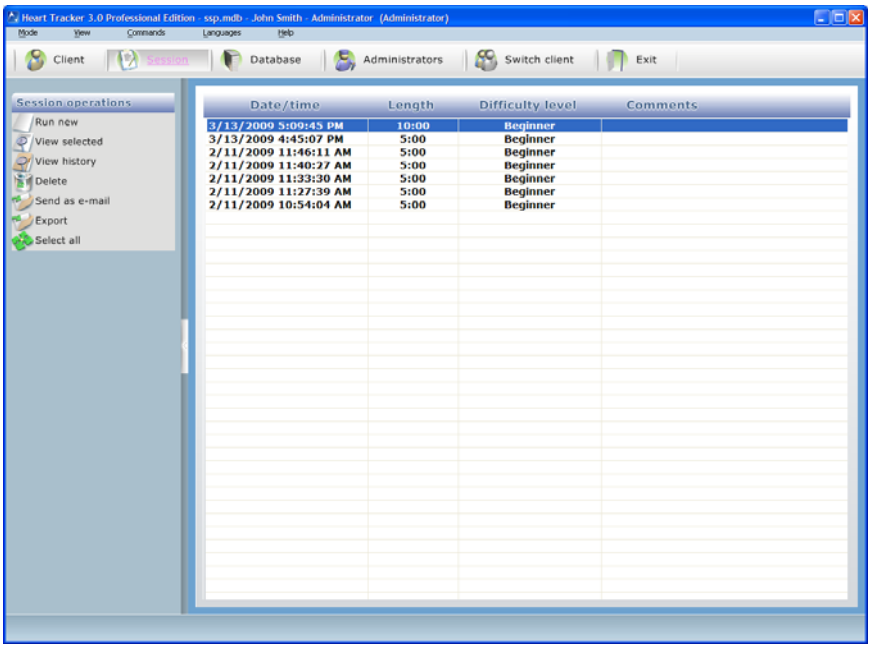
Use the **End Session** menu option to finish your training session if you selected the protocol of unlimited duration. You can also stop the session with preset duration before its time elapses. Once session is stopped the session data will be stored in the user's record and you will then be taken to the Training Summary Page (see a detailed description below).

# 7. View Training Summary

This mode is used to view the details on selected training session.

To view the training summary, click on the **Session** menu option.

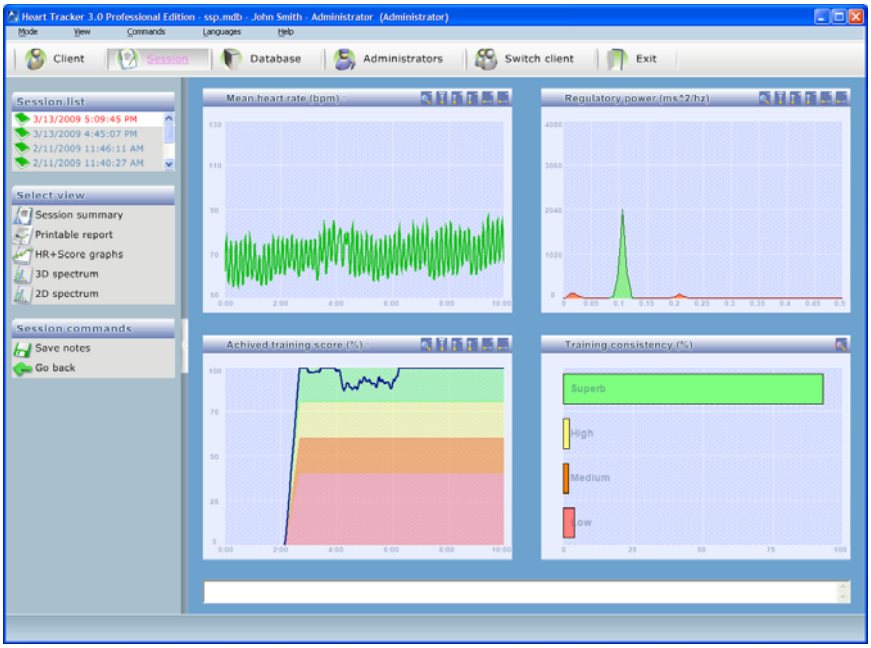
The following window appears:




Then:

1. Select a session from the list.
2. Click the **View Selected** menu option.

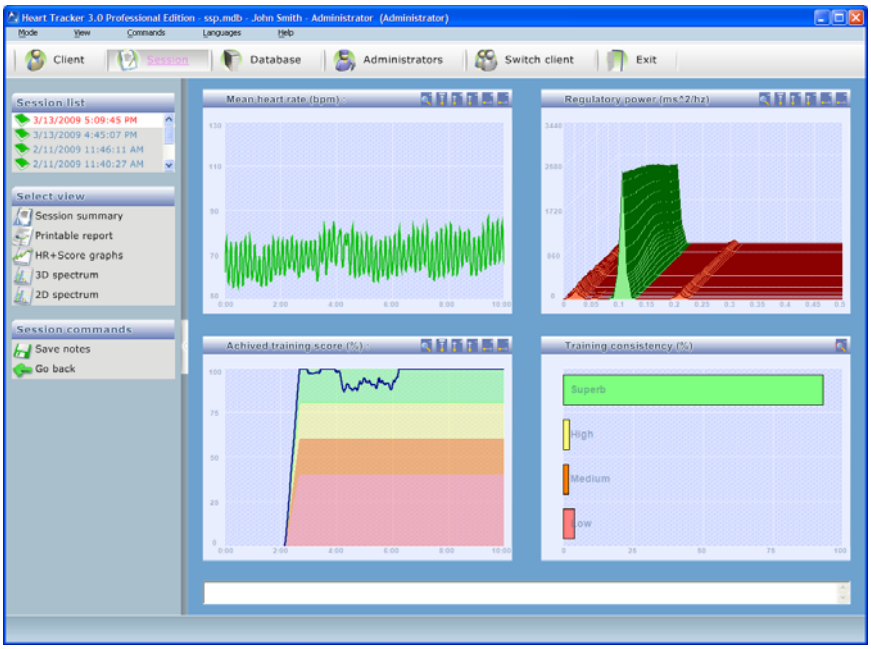
The following window appears:




**Note:** If you use the Biocom 3000 ECG recorder with a respiration sensor option an additional red line will be shown on the graph to indicate breathing activity.

If other view is selected click on the **Session Summary** menu option to see this view again.

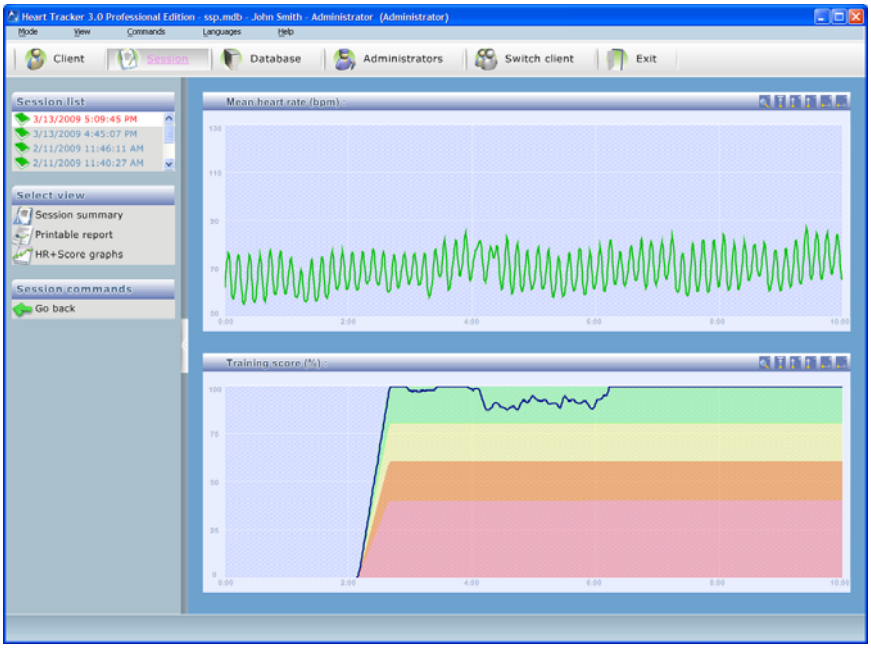
By default this screen shows 2-dimentional view of the power spectrum of entire record of the heart rate. By clicking on the **3D Spectrum** menu option you can switch the spectrum to its 3-dimentional view showing the history of the power spectrum during the session:



**Note:** If you use the Biocom 3000 ECG recorder with a respiration sensor option an additional red line will be shown on the graph to indicate breathing activity.

You can go back to 2-dimentional spectrum view by clicking on the **2D Spectrum** menu option.

Click on the **HR+Score Graphs** menu option to show the following view:




**Note:** If you use the Biocom 3000 ECG recorder with a respiration sensor option an additional red line will be shown on the graph to indicate breathing activity.

# 7.1. Adjusting the Graph Scales

Here, you can use the buttons at the top right corners of each screen to adjust the graphs.

This button maximizes and minimizes the graph.

This button automatically adjusts the vertical (amplitude) scale of the graph.

This button increases the vertical (amplitude) scale of the graph.

This button decreases the vertical (amplitude) scale of the graph.

This button increases the horizontal (time) scale of the graph.

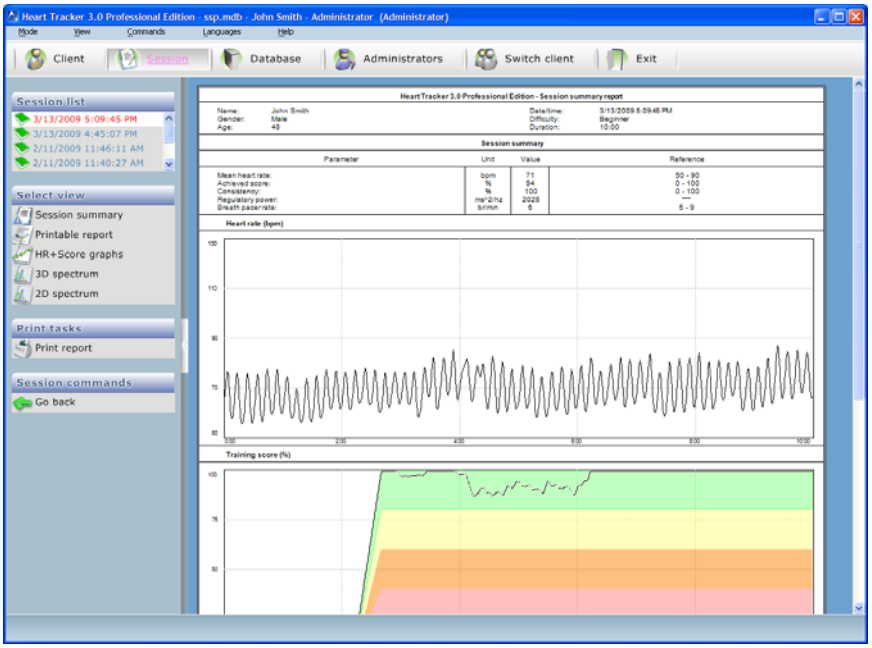
This button decreases the horizontal (time) scale of the graph.

# 7.2. Viewing Printable Report

To view a printable version of a session summary report, you must first select the **Session** menu option.

Highlight a session and click on **View Selected**.

Now, click on the **Printable Report** menu option to view a printer friendly version of the session summary report.

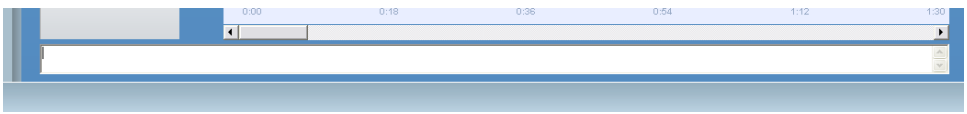



# 7.3. Printing Report

To print out a hard copy of a session summary report, go into the printable report and click on **Print Report**.

# 7.4. Entering Session Comments

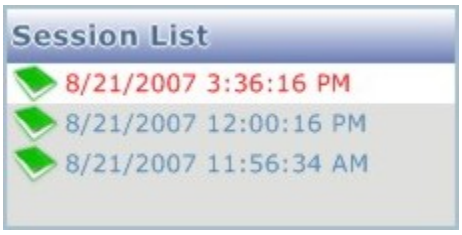
You may write comments and attach them to a session summary report. To do this go into a session summary report and write in the field at the bottom of the screen.



You may save the comments by clicking on the **Save** menu option.

## 7.5. Viewing Other Sessions

To view the session summary reports for other sessions, simply select the date / time of that session from the list on the left panel.




The program will automatically update the current view to show selected session data.

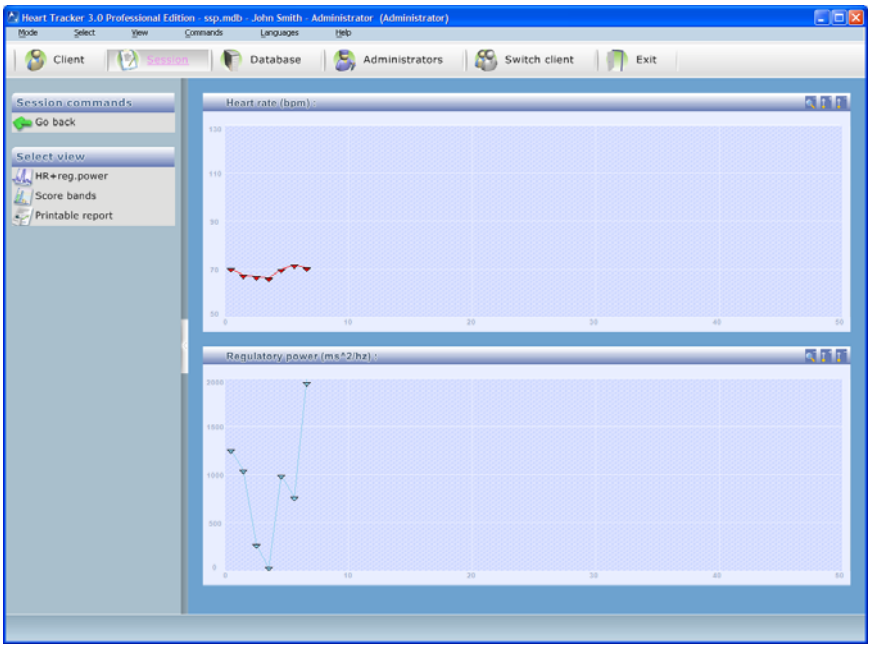
# 8. View Training History

This mode is used to view the history of training achievements across all training sessions stored in the record.

To view the training history:

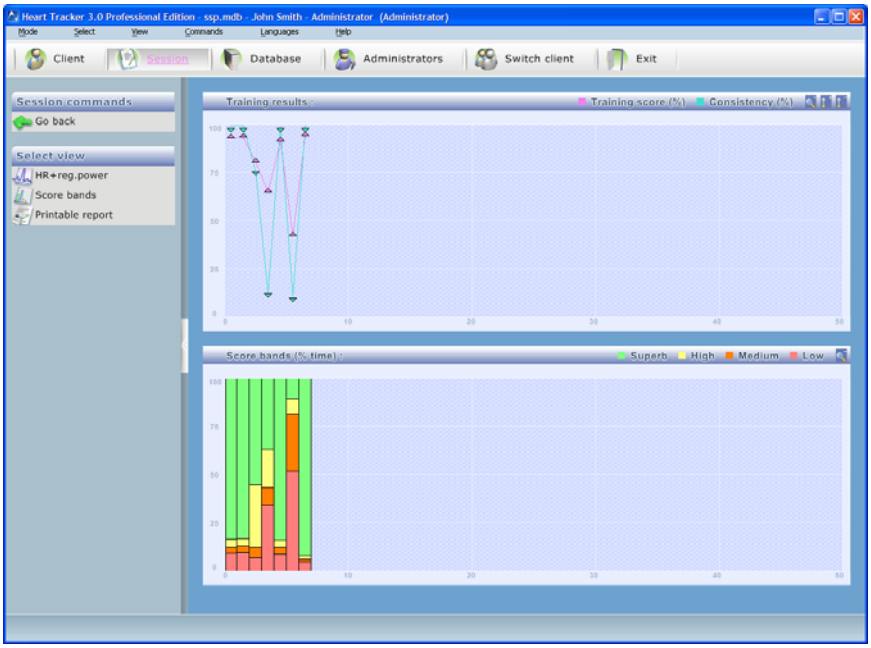
1. Click on the **Session** menu option.
2. Click on the **View History** menu option on the menu on the left.

The following window appears:




This screen displays the history of session averages of heart rate and regulatory power.

You can click on the **Score Bands** menu option to view the history of session training results: training score and consistency as well as the training score distributions among the standard score bands:




## 8.1. Adjusting the Graph Scales

You can adjust the scales of these graphs using the buttons in the top right corners of the graphs.

This button maximizes and minimizes the graph.

This button increases the vertical (amplitude) scale of the graph.

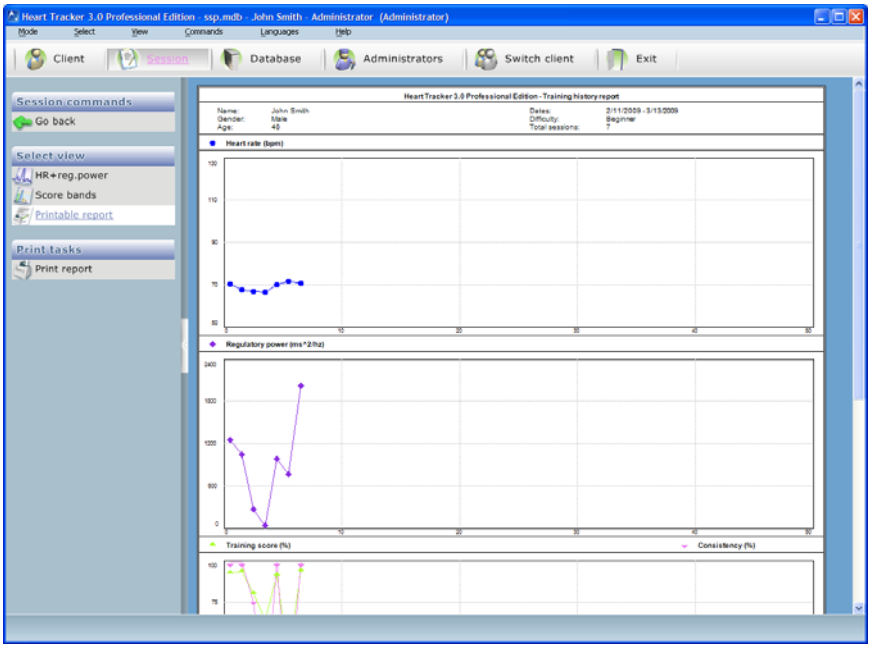
This button decreases the vertical (amplitude) scale of the graph.

## 8.2. Viewing Printable History Report

To view a printable version of a session summary report, you must first go into the **Session** section.

Click on **View History**.

Now, click on the **Printable Report** menu option to view a printer friendly version of the history report.



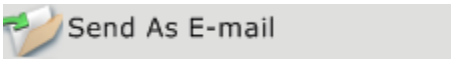

# 8.3. Printing Report

To print out a hard copy of a history report, go into the printable report and click on **Print Report**.

# 9. Other Session Data Options

From the **Session** page, you may also choose to:

Delete any selected session data.



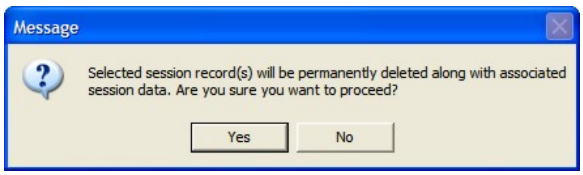

Send your session data as a .zip file over e-mail.

Export your session data.

Select all existing sessions.

## 9.1. Deleting Selected Sessions

To permanently delete a session summary, highlight the summary(ies) and click on the **Delete** menu option. The following window pops up:




Click **Yes** to delete. You may click on the **Select All** menu option to select all session summaries for deletion.

## 9.2. Sending Session Data Over E-mail

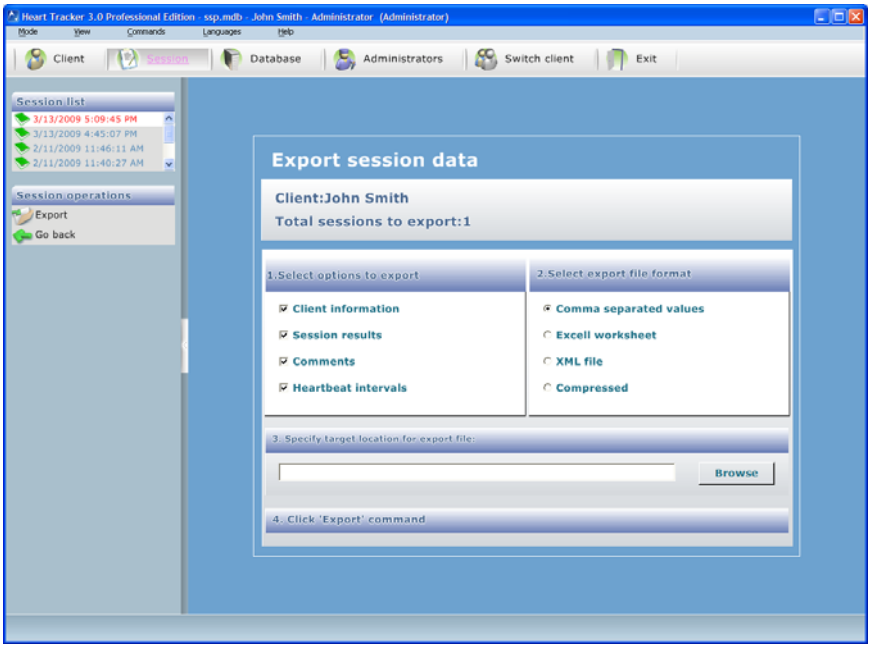
To send a selected session summary as an e-mail, click on the **Send as E-Mail** menu option. This opens your default e-mail client from where you can specify the data recipient's address. The file is already attached to the e-mail.

You may click on the **Select All** menu option to select all session summaries for sending.

## 9.3. Exporting Session Data

Heart Tracker 3 Pro gives you the option to export your session data. When you export your data, you create a new standalone file on your drive.

When you choose to **Export** a session summary, the following window opens:




Here, you may choose:

- Which data to send
- What format to export it into
- Where to save exported data to on your computer

The different formats available are:

- Comma separated values (creating an ASCII file)
- Excel Worksheet (a standard Microsoft Excel file)
- XML file (also readable in Microsoft Excel)
- Compressed file (readable by Biocom HRV Live! Software).

When you are satisfied with your settings, click on the **Export** menu option.

# 10. Get Help

To obtain help information about software operation, click the **Help** at the top of the screen. The following menu options will be shown in the dropdown menu:

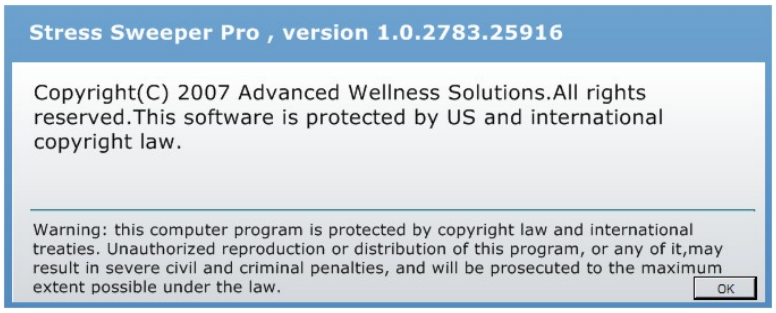
- Help Content
- Visit Biocom website
- About Heart Tracker 3 Pro
- Check for updates

If you select the **Help Content** menu option, it will open this document in a separate window. Use the table of contents to navigate through the document.

Close the **Help** window to go back to the program window.

Select the **Visit Biocom website** menu option to open it in a separate web browser window.

If you select the **About Heart Tracker 3 Pro** menu option the following window will be shown:




Click **OK** to close it.

If you select the **Check for updates** menu option the software will connect to BIOCOM TECHNOLOGIES server and check if new update is available. If so the update will be downloaded and you will be prompted to install it.

# 11. Exit the Heart Tracker 3 Pro

To exit the Heart Tracker 3 Pro software, click on the **Exit** button at the top of the screen.